THE UNIVERSITY OF MINNESOTA

BULLETIN

THE

Vol. VII JUNE 15, 1904 No. 8

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The University Bulletins are issued every six weeks during the University year, at least six numbers every calendar year. Entered at the Postoffice in Minneapolis as second-class matter.

MINNEAPOLIS, MINN.

The University Bulletins are published by authority of the Board of Regents, six times a year,—every six weeks during the University year. Bulletins will be sent gratuitously, postage paid, to all persons who apply for them. In calling for bulletins, please state department of the University concerning which you desire information. The full catalogue will be sent only upon receipt of ten cents to pay postage. Address,

THE REGISTRAR,
The University of Minnesota,
Minneapolis, Minn.

The University.

THE UNIVERSITY OF MINNESOTA comprises the following named colleges, schools and departments:

THE GRADUATE DEPARTMENT

THE COLLEGE OF SCIENCE, LITERATURE AND THE ARTS, including—
the School of Analytical and Applied Chemistry

THE COLLEGE OF ENGINEERING AND THE MECHANIC ARTS

THE SCHOOL OF MINES

THE DEPARTMENT OF AGRICULTURE, including—
the College of Agriculture
the School of Agriculture
the Dairy School
the Short Course for Farmers

THE COLLEGE OF LAW

THE DEPARTMENT OF MEDICINE, including—
the College of Medicine and Surgery
the College of Homeopathic Medicine and Surgery
the College of Dentistry
the College of Pharmacy

The Regents of the University have also entrusted to their charge

THE EXPERIMENT STATION, including—
the Main Station at St. Anthony Park
the Sub-Station at Crookston
the Sub-Station at Grand Rapids

THE GEOLOGICAL AND NATURAL HISTORY SURVEY

THE GRADUATE DEPARTMENT. In each of the colleges, except that of medicine, there are advanced courses of study leading to second degrees. These courses are open to graduates of any reputable college upon presentation of diploma.

In the COLLEGE OF SCIENCE, LITERATURE AND THE ARTS, there is a four-years course of study leading to the degree, bachelor of arts. The work of the first two years is elective within certain limitations as to the range of subjects from which the electives are to be chosen. The work of the last two years is entirely elective. The course is so elastic that it permits the student to make the general scope of the course, classical, scientific or literary, to suit the individual purpose.

THE SCHOOL OF ANALYTICAL AND APPLIED CHEMISTRY, offers two four-year courses of instruction in chemistry, one mainly analytical the other applied. The degree of bachelor of science (in chemistry) is conferred upon those who complete either course in a satisfactory manner.

A Summer School for Teachers. A six-weeks' course of instruction is offered, in various University subjects, for those whose school duties prevent them from taking the regular University courses.

The College of Engineering and the Mechanic Arts offers courses of study, of four years each, in civil, mechanical, electrical and municipal engineering leading to the degrees of civil, mechanical, electrical and municipal engineer. This college offers a four-years course of study in science and technology leading to the degree of bachelor of science, with an additional year leading to the engineer's degree in any one of the various lines offered in the college. This college also offers graduate work leading to the degree master of science.

The School of Mines offers a four-years course of study in mining and metallurgy upon completion of which the degrees, engineer of mines and metallurgical engineer, are conferred.

The College of Agriculture offers a four-years course in agriculture. The degree of bachelor of agriculture is conferred on completion of the course. Students in this college may specialize along the line of forestry or home economics and secure the degree bachelor of agriculture (in forestry or in home economics).

The School of Agriculture offers a three-years course of study and is a training school for practical farm life and in domestic economy. The college of agriculture is open to graduates of this school who have completed the fourth year of work required for admission to the college.

The Dairy School offers practical instruction in dairying to those who are actually engaged in the manufacture of butter and cheese.

The Short Course for Farmers is designed to be of the greatest help possible to those actually engaged in farming.

The College of Law offers a three-years course of instruction leading to the degree of bachelor of laws. There is an evening class provided in this college. Graduate work leading to the degrees, master of laws, and doctor of civil law, is offered.

The College of Medicine and Surgery and The College of Homeopathic Medicine and Surgery offer four-year courses of study of nine months each. Upon completion of either of the prescribed courses the degree, doctor of medicine is conferred.

In the colleges of science, literature and the arts, of medicine and surgery, and homeopathic medicine and surgery, there has been established a combined course of six years leading to the degrees of bachelor of science and doctor of medicine.

The College of Dentistry offers a four-years course of study of nine months each. Upon completion of the prescribed course the degree of doctor of dental surgery is conferred.

The College of Pharmacy offers a two- or three-years course of study leading to the degree of pharmaceutical chemist. This college also offers graduate work leading to the degrees, master of pharmacy and doctor of pharmacy.

Special Courses. In each of the colleges, students of an advanced age and adequate preparation are permitted to pursue, under the direction of the faculty, one or two distinct lines of study.

The University offers no correspondence courses.

The Board of Regents.

The HON. GREENLEAF CLARK, M. A., St. Paul, - 1910
President of the Board

CYRUS NORTHROP, LL. D., Minneapolis, - - - *Ex-Officio*
The President of the University

The HON. SAMUEL R. VAN SANT, Winona, - - *Ex-Officio*
The Governor of the State

The HON. JOHN W. OLSEN, Albert Lea, - - - *Ex-Officio*
The State Superintendent of Public Instruction

The HON. STEPHEN MAHONEY, B. A., Minneapolis, - 1907
Secretary of the Board

The HON. O. C. STRICKLER, M. D., New Ulm, - - - 1907

The HON. JAMES T. WYMAN, Minneapolis, - - - - 1907

The HON. ELMER E. ADAMS, B. A., Fergus Falls, - 1909

The HON. THOMAS WILSON, St. Paul, - - - - - - 1909

The HON. WILLIAM M. LIGGETT, Benson, - - - - 1909

The HON. A. E. RICE, Willmar, - - - - - - - - - 1909

The HON. EUGENE W. RANDALL, Morris, - - - - 1910

Executive Officers.

THE UNIVERSITY.

Cyrus Northrop, LL. D., *President*
E. Bird Johnson, B. S., *Registrar*
George H. Hayes, *Accountant and Purchasing Agent*

THE COLLEGES.

John F. Downey, M. A., C. E., *Dean of the College of Science, Literature and the Arts*
Frederick S. Jones, M. A., *Dean of the College of Engineering and the Mechanic Arts*
William R. Appleby, M. A., *Dean of the School of Mines*
William M. Liggett, *Dean and Director of Department of Agriculture*
William S. Pattee, LL. D., *Dean of the College of Law*
Parks Ritchie, M. D., *Dean of the College of Medicine and Surgery*
Eugene L. Mann, M. A., M. D., *Dean of the College of Homeopathic Medicine and Surgery*
William P. Dickinson, D. D. S., *Dean of the College of Dentistry*
Frederick J. Wulling, Ph. G., *Dean of the College of Pharmacy*
Dexter D. Mayne, *Principal of the School of Agriculture*

LIBRARIES AND MUSEUMS.

William Watts Folwell, LL. D., *Librarian*
Lettie M. Crafts, B. L., *Assistant Librarian*
Ina Firkins, B. L., *Library Assistant*
Anna L. Guthrie, B. A., *Library Assistant*
Mary S. McIntyre, B. S., *Librarian of School of Agriculture*
Thomas G. Lee, M. D., *Librarian of Department of Medicine*
Hugh E. Willis, LL. M., *Librarian of the College of Law*
Christopher W. Hall, M. A., *Curator Geological Museum*
Henry F. Nachtrieb, B. A., *Curator of the Zoological Museum*

Allen W. Guild, *Superintendent of Buildings*
Edwin A. Cuzner, *Superintendent of Grounds*

Calendar for 1904-1905

1904

1905

JULY

S.	M.	T.	W.	T.	F.	S.
..	..	..	..	..	1	2
3	**4**	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	..	..	..	..	..	..

AUGUST

..	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	**30**	31	..	..	..
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SEPTEMBER

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OCTOBER

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9	10	11	12	13	14	15
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30	31	..	..	..	..	..

NOVEMBER

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6	7	8	9	10	11	12
13	14	15	16	17	18	19
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DECEMBER

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18	19	20	21	22	23	24
25	26	27	28	29	30	31
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JANUARY

S.	M.	T.	W.	T.	F.	S.
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FEBRUARY

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12	13	14	15	16	17	18
19	20	21	**22**	23	24	25
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MARCH

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APRIL

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MAY

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21	22	23	24	25	26	27
28	29	**30**	31	..	..	..
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JUNE

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18	19	20	21	22	23	24
25	26	27	28	29	30	..
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University Calendar, 1904-1905.

FIRST SEMESTER.

AUGUST	30	T	Entrance examinations and registration.
	31	W	Entrance examinations and registration.
SEPTEMBER	1	T	Entrance examinations and registration.
	2	F	Entrance examinations and registration.
	3	S	Entrance examinations and registration. 1 w
	5	M	Examinations end and registration completed.
	6	T	Classes called for regular work.
	10	S	..... 2 w
	15	T	(First College classes organized, 1869)
	17	S	..... 3 w
	24	S	..... 4 w
OCTOBER	1	S	..... 5 w
	8	S	..... 6 w
	15	S	..... 7 w
	22	S	..... 8 w
	29	S	..... 9 w
NOVEMBER	5	S	.....10 w
	12	S	.....11 w
	19	S	.....12 w
	24	T	Thanksgiving Day. Holiday.
	26	S	.....13 w
DECEMBER	3	S	.....14 w
	6	T	Annual Meeting of the Board of Regents.
	10	S	.....15 w
	17	S	Holiday recess begins (no classes).....16 w
	25	S	Christmas Day.
JANUARY	1	S	New Year's Day.
	3	T	Work resumed in all departments.
	7	S	.....17 w
	14	S	.....18 w
	16	M	Semester examinations. I and II hour work.
	17	T	Semester examinations. III and IV hour work.
	18	W	Semester examinations. V and VI hour work.
	19	T	Semester examinations. VII and VIII hour work.
	21	S	.....19 w

SECOND SEMESTER.

JANUARY 24 T Second Semester begins—Classes called for regular work.
28 S ..... 1 w
FEBRUARY 4 S ..... 2 w
11 S ..... 3 w
12 S Lincoln's Birthday.
18 S University Charter, 1868. General Sibley died, 1891 ..... 4 w
22 W Washington's Birthday.
25 S .....
MARCH 4 S ..... 5 w
11 S ..... 6 w
18 S ..... 7 w
25 S ..... 8 w
APRIL 1 S ..... 9 w
8 S .....10 w
15 S .....11 w
22 S .....12 w
29 S .....13 w
MAY 6 S .....14 w
13 S .....15 w
20 S .....16 w
22 M Semester examinations. I and II hour work.
23 T Semester examinations. III and IV hour work.
24 W Semester examinations. V and VI hour work.
25 T Semester examinations. VII and VIII hour work.
27 S .....18 w

COMMENCEMENT WEEK.

SUNDAY May 28 Baccalaureate Service.
MONDAY May 29 Senior Class Exercises.
TUESDAY May 30 Senior Promenade.
WEDNESDAY May 31 Alumni Day.
THURSDAY June 1 Commencement Day—The Thirty-third Annual Commencement.
FRIDAY June 2 Summer Vacation Begins.

PROGRAM OF EXAMINATIONS, SEPTEMBER, 1904.

THE COLLEGE OF SCIENCE, LITERATURE AND THE ARTS.
THE COLLEGE OF ENGINEERING AND THE MECHANIC ARTS.
THE SCHOOL OF MINES.
THE COLLEGE OF LAW.
THE COLLEGE OF AGRICULTURE.

The number placed after the subjects, when given, indicates the room in which the examinations will be held.

Day	Hour	Subjects for admission to the freshman class.
Tuesday, August 30,	8:00-10:30	†English Classics 13
	10:45- 1:15	*English Composition 1
	2:30- 5:00	*Elementary Algebra 22
Wednesday, Aug. 31,	8:00-10:30	*Higher Algebra 22
	10:45- 1:15	*Plane Geometry 22
	2:30- 5:00	*Solid Geometry 22
Thursday, Sept. 1,	8:00-10:30	†All History Subjects..... 17
		†Civics 16
		†Political Economy 16
	10:45- 1:15	*German 21
		*French 28
	2:30- 5:00	*Latin Grammar 4
Friday, September 2,	8:00-10:30	*Greek 25
		*Cæsar 4
		†English Literature 13
	10:45- 1:15	*Cicero 4
		*Vergil 4
	2:30- 5:00	§Chemistry .....
		**Physics .....
Saturday, Sept. 3,	8:00-10:00	‡Botany 29
		‡Zoology 35
		*Astronomy ..... B
	10:45- 1:15	‡Geology 18
		¶Physiography 18
	2:30- 5:00	¶Drawing 24
		¶Shop Work .....

*Main Building; †Library Building; ‡Pillsbury Hall; §Chemical Laboratory; **Armory; ¶The Shops.

The College of Agriculture

THE FACULTY

CYRUS NORTHROP, LL. D., *President.*
WILLIAM LIGGETT, *Dean.*
SAMUEL B. GREEN, B. S., *Professor of Horticulture and Forestry.*
HARRY SNYDER, B. S., *Professor of Agricultural Chemistry.*
T. L. HAECKER, *Professor of Dairy Husbandry.*
M. H. REYNOLDS, M. D., V. M., *Professor of Veterinary Medicine and Surgery.*
WILLETT M. HAYS, M. Agr., *Professor of Agriculture.*
ANDREW BOSS, *Associate Professor of Agriculture, in charge of Live Stock.*
FREDERICK L. WASHBURN, M. A., *Professor of Entomology.*
D. D. MAYNE, *Principal of School of Agriculture, Economics.*

INSTRUCTORS.

WILLIAM ROBERTSON., B. S., *Agricultural Physics.*
J. A. VYE, *Penmanship, Accounts.*
J. M. DREW, *Blacksmithing, Poultry.*
JUNIATA L. SHEPPERD, M. A., *Cooking, Laundering.*
MARGARET BLAIR, *Sewing.*

ASSISTANT INSTRUCTORS.

JOHN A. HUMMEL, B. Agr., *Agricultural Chemistry.*
C. P. BULL, B. Agr., *Agriculture.*
A. J. RUGGLES, B. S. A., *Entomology.*
M. L. ERICKSON, M. Agr., *Forestry.*

In the College of Agriculture three regular courses of study are offered: A course in agriculture, a course in forestry, and a course in home economics.

REQUIREMENTS FOR ADMISSION TO ALL COURSES IN THE COLLEGE OF AGRICULTURE.

Graduates of the school of agriculture, who have completed the studies prescribed in the intermediate course, or fourth year, and graduates of approved high and normal schools, as approved by the committee on entrance requirements and

course of study, are admitted to the freshman class in the courses in the college of agriculture; the former to Division "A," and the latter to Division "B."

Students who take courses in the college of science, literature and the arts, or in other colleges of the University, are required to conform to rules published in the bulletins of the respective colleges.

Students from other colleges and universities: Graduates from other colleges and universities may be admitted upon presentation of certificates, and will receive credit from the several professors for all work satisfactorily completed of similar character and grade to that given in this course.

Special students: Graduates of the school of agriculture may be admitted as special students and be allowed to pursue such studies in the course offered in the college of agriculture as are approved by the faculty.

All students in the college of agriculture must advise with the dean or the committee on college and graduate work concerning all electives. No student is allowed to enter any course until such course is properly entered upon the student's registration card by the registrar of the University, and no credit shall be given for subjects in which the student has not been previously registered.

GRADUATE WORK.

Special facilities are offered to graduate students from this and other agricultural colleges who wish to become familiar with methods employed in experiment station work, and to pursue their collegiate studies further. Courses for major and minor subjects may be arranged by consulting the professors in the different divisions. Students who enter for advanced degrees register with the committee on registration of the college of agriculture and must take their major subjects in the college of agriculture, but they may take one or both of their two minor subjects in the college of science, literature and the arts. Graduate students registered with the committee on graduate studies in the college of science, literature and the arts may take one or both of their minor subjects in the college of agriculture.

I. The degree of Master of Agriculture will be conferred on a bachelor of this or any other agricultural college of equal grade who, not sooner than one year after graduation, if a resident graduate student at this agricultural college, shall

pass an examination in certain prescribed lines of study and present a satisfactory thesis.

II. All general regulations of the college of science, literature and the arts, governing candidates for the master's degree, method of selecting work, amount of work required, degree of proficiency expected, and the time and manner of conducting the examinations, apply to candidates for master's degrees in the college of agriculture.

III. The degree of Doctor of Philosophy will be conferred by the college of agriculture on bachelors of this or any other agricultural college of equal grade within not less than three years after graduation therefrom under conditions similar to those prescribed by the faculty of the college of science, literature and the arts.

FEES.

All students in the college, who are residents of the state, are charged an incidental fee of ten dollars a semester. Non-residents are charged double the fee required of residents of the state, or twenty dollars a semester. No reduction is made for late entrance or for leaving before the end of the semester. In addition to this fee, students who take work in laboratories are charged a sum sufficient to cover the cost of material and breakage.

REQUIREMENTS FOR GRADUATION AND DEGREES.

After the completion of the prescribed course of study, including all of the required work and the requisite amount of elective work, together with such practical experience as may be required by the committee on college course, students in the courses in agriculture will be recommended for graduation with the degree of bachelor of science in agriculture; students in forestry with the degree of bachelor of science in forestry, and students in the course in home economics with the degree of bachelor of science in home economics.

The elective studies designed as academic are to be chosen from the printed semester programs of work offered in the colleges of science, literature and the arts, law, medicine and engineering; no student to take more than two semesters in either of the three last named colleges. The elective studies designated as agricultural are to be chosen from the printed program of work offered in the college of agriculture.

THE COURSE IN AGRICULTURE.

The course in agriculture is designed to give the student a broad education in the sciences and arts relating to agriculture and to fit him for the work of the agriculture specialist The physical and biological sciences are made prominent. The work in these subjects is begun in the first or second year and may be continued throughout the course. For the first two years, the lines of study are prescribed, the subjects being chosen with a view of giving a good foundation for the work which follows. For the last two years, the work is mostly elective and gives the student an opportunity to take work along certain lines for which he has a special aptitude and liking.

In the college of agriculture a portion of the work is taken in the college of science, literature and the arts. All academic electives and the prescribed work in higher algebra, drawing, geology, German, French, rhetoric, trigonometry, botany, zoology, psychology, English literature, logic, philosophy, pedagogy and history are taken in the college of science, literature and the arts. The agricultural electives and the prescribed subjects not mentioned above are taken at University Farm.

OUTLINE OF COURSE IN AGRICULTURE.

FRESHMAN YEAR.

DIVISION "A."

Required for graduates of the School of Agriculture only.

FIRST SEMESTER.

Mathematics [4]
Drawing [4]
Geology [4]
German [4]
Military Drill [2]
Gymnasium [2]

SECOND SEMESTER.

Mathematics [4]
Chemistry [2]
German [4]
Agricultural engineering or drawing [4]
Rhetoric [4]
Military Drill [2]
Gymnasium [2]
Land surveying [2]

FRESHMAN YEAR.

DIVISION "B."

For graduates of approved high schools or others of equal standing. Students in this division take part of their work in classes of the school of agriculture. For descriptions of these courses see statement under School of Agriculture.

SEPTEMBER.

Agriculture [4]
Forestry [4]
Dairy chemistry [4]
Blacksmithing [4]
Agriculture practicums [2]

Handling grain and farm machinery [4]
Fruit growing [4]
Breed type of horses [4]
Carpentry [4]

AGRICULTURAL SCHOOL YEAR.

FIRST TERM.

Dairy husbandry [2½]
Breeding [2]
Agricultural chemistry [5]
Fruit growing [2]
Veterinary [2]
Entomology [5]
Physics [5]
Forestry [2]
Military drill [2]
Gymnasium [2]

SECOND TERM.

Dairy husbandry [2½]
Feeding [2]
Soils and fertilizers [5]
Vegetable gardening [2]
Veterinary [2]
Field crops [2]
Study of breeds [2]
Plant propagation [3]
Military drill [2]
Gymnasium [2]
Economics [3]

LAST HALF OF SECOND SEMESTER.

Chemistry [2]
Poultry [3]
Blacksmithing [4]
Bookkeeping [3]

Dairy stock and judging [2]
Agricultural engineering [4]
Stock judging [2]
Live stock practicums [2]
Surveying [4]

SOPHOMORE YEAR.

Botany or zoology, long, a. m. [3]
Botany or zoology, short, a. m. [3]
Chemistry, p. m. [4]
German or French, p. m. [3]
Agricultural physics, p. m. [2]
Rhetoric, p. m. [1]
Military drill [2]

(T. & W. Laby.) (Lect. M. 11 a. m.)

(Thurs. and F. at 3:45 p. m.)

JUNIOR YEAR.

Botany or zoology, long, a. m. [3]
Elective, academic, a. m. [3]
Elective academic, a. m. [3]
Elective, agricultural, minor, p. m. [4]
Elective, agricultural, major, p. m. [4]

SENIOR YEAR.

Elective, academic, a. m. [3]
Elective, academic, a. m. [3]
Elective academic, a. m. [3]
Elective, agricultural, minor, p. m. [4]
Elective, agricultural, major, p. m. [4]

Note.—No more than two semesters' work to be taken in any one subject for the minors in the junior and senior year.

The subject selected as the major elective is to be carried through both junior and senior years, and is to be concluded by a thesis to cover at least one year of practical work.

AGRICULTURE.

Equipment: The general equipment of University farm is available for class and special instruction and for practice work. A seed breeding laboratory furnishes facilities for special instruction in field seeds and in laboratory work in plant breeding. The plant breeding nurseries, the variety testing and the seed distribution, afford facilities for instruction and practice to students especially interested in these lines of work. The experiments and records in field management, in crop rotation and in cultivation experiments provide material and opportunities for study and for gaining experience. Instruments of precision make practical the instruction in planning farms, land drainage, road making, and fence building. The farms of the vicinity serve as a basis for de-

signing farm plans and farm business, and rural engineering problems can be worked out in nearby rural communities. Many useful samples, drawings, photographs, and references are being collected. The exhibits of machinery at the state fair grounds adjoining University farm, and those on exhibition in the warehouses of Minneapolis and St. Paul, supplement the collection in use at University farm. Students can study the merchandising of grain, the inspection and the grading of the various grain products in the twin cities. Statistics relating to the cost and profit of each staple farm crop are being gathered by special agents in three representative counties of the state.

A portion of the instruction in agriculture is in the form of lectures. The writing of papers on special subjects is made a prominent feature. Research work is arranged for in many cases, and practice work on the farm and in the laboratory is provided. The aim is to have students get experience in field agriculture, both practical and experimental, and in demonstration instruction.

Course I. Field crops and seeds. [One semester.]

In this course are considered the botany, cultivation, irrigation, use and place in the rotation of the various cereal, forage, root, fiber, sugar and miscellaneous crops. Special attention is given to the subjects of permanent, rotation, annual and shift pastures, and to soilage crops, to permanent and rotation meadows, and to the production and preservation of all kinds of dry-cured and ensilaged fodders. A thesis on one or more field crops is required of each student.

Course II. Thremmatology.

Heredity, variation, laws of breeding, the art of breeding, improvement by nature and under scientific experimentation, securing foundation stocks, value of using very large numbers, immense value of the occasional individual which can transmit qualities of peculiar value, use of an ideal, use and misuse of the score card, both numerical and graphic, intrinsic qualities, fancy points and distinguishing marks, statistical methods in breeding, pedigree records of efficiency, fundamental principles underlying the arrangement of the record books, bibliography and terminology, study of the literature of breeding.

Botany of the reproductive organs of field crops, field crop nursery management, producing new qualities by hybridizing and by change of environment, hybridizing versus cross-breeding, in-breeding and self fertilization, originating varieties and improving standard varieties, by selection and by hybridizing followed by selection, methods of disseminating new varieties, seed and plant introduction, experimentation in the theories relating to heredity, variation and practical breeding, seed growing as a farm business, seed merchandising. The breeding of each of the various field crops grown in Minnesota.

Course III. Rural engineering. [One semester.]

Subduing new prairie and timber soils, farm drainage, irrigation and irrigation works, tillage of crops, roads, their financial support, their location, construction and maintenance, farm buildings, farm fences, farm implements and machinery.

Course IV. Agricultural economics. [One semester.] '04-'05.

Farm management, systems of farming, planning farms, fields, crops, stock, labor, farm finances, sales, prices, agricultural statistics, production, exports, wages, land laws, ownership, taxes, organizations.

Agricultural practicums. Opportunities to gain practical experience, to acquire greater manual dexterity in doing farm work to secure practice in conducting experiments and to get experience in teaching agricultural subjects, are offered to college and graduate students, when practicable. Students should arrange early in their course for this work, as the opportunities in plant breeding, in rural engineering, in field crops, in agricultural statistics and in assisting instructors in the various courses are available only at irregular intervals and must be arranged for in advance.

AGRICULTURAL CHEMISTRY.

Equipment. A special laboratory with modern apparatus for the analyses of soils, foods and agricultural products is provided. The equipment contains an experimental mill for the production of wheat flour, a Berthelot-Atwater calorimeter for the determination of the caloric value of foods, vaccum ovens, apparatus for the chemical and physical analysis of soils, an electrical apparatus for determining the resistance of soils to soluble salts, and the necessary facilities for human and animal food investigations. Special facilities are offered in soil investigations and in the analysis and testing of wheat, flour and cereal products for commercial purposes. Standard reference books and journals, including Jahresbericht der Agrikultur Chemie, Coptes Rendus, Biedermann's Centralblatt, Annals de la Science Agronomique and Versuchs-Stationen, are provided for the advanced work in agricultural chemistry.

Fees. In all of the laboratory courses in agricultural chemistry, a fee is charged to cover the cost of material used, and breakage. The student is assigned a certain amount of apparatus and material for which he gives a receipt, and deposits $3 with the accountant before beginning work. All apparatus returned in good condition at the close of the term is credited to the student's account upon settlement.

Two and one-half semesters of chemistry are required in the freshman and sophomore years. All other courses are elective.

Course I. (a) General agricultural chemistry. [One-half semester.] Freshman II.

Recitations, lectures and laboratory practice. Particular attention is given to the study of the elements and compounds which are of the most importance in agriculture. The laws governing the combination of the elements by weight and volume are illustrated by numerous problems. The writing of equations, chemical nomenclature, and the periodic system of classifying the elements are prominent features of the work. In the laboratory, experiments are performed illustrating the general laws of chemistry which have a bearing upon animal and plant life.

(b) A continuation of I (a). Sophomore I. semester.

Course II. Agricultural qualitative analysis. Sophomore II.

This course is arranged to meet the wants of agricultural students. Six hours per week are given to the laboratory work and one period to a lecture and recitation. The writing of equations and the study of prin-

ciples involved in the separation of the various groups and individual compounds of elements are characteristic features of this work. It is the object of this course to familiarize the student with the processes employed in qualitative analysis so that he may be able to determine the composition of all ordinary substances, particularly of those that are of the most importance in agriculture.

Course III. Agricultural quantitative analysis. Junior or senior I.

An elementary course in qualitative analysis. The principles involved in gravimetric and volumetric analysis are studied. Three periods per week are given to laboratory work and one period to a recitation and lecture. The work includes the gravimetric and volumetric determinations of iron, acidimetry and alkalimetry, the gravimetric determination of phosphorous pentoxide, the volumetric determination of calcium oxide and determination of nitrogen and potassium oxide. The object of this course is to prepare the student for special work in agricultural chemistry, and is required of all students who elect either courses VI or VII.

Course IV. The chemistry of foods. [One-half semester.]

Lectures. This course treats of the chemistry of human and animal foods, the chemistry of plant growth, the composition and food value of the various organic compounds contained in plants, the influences which soil and climate exert upon plant growth and the various factors which influence the value and composition of farm crops. The chemistry of human and animal nutrition is also considered. It is the object of this course to familiarize the student with the more recent investigations which have a bearing upon the chemistry of human and animal foods and to enable him to utilize these results to the best advantage in the production and use of foods. Ample facilities are offered in both laboratory and library for the study of this subject. (Given only in alternate years. Given in 1905-06.)

Course V. The chemistry of soils and fertilizers. [One-half semester.] II.

Lectures. The chemical changes that take place in the soil; the various sources of plant food; the power which crops possess for obtaining food from the soil; nitrification; the laws governing the increase and decrease of the soil nitrogen and the organic compounds of the soil and the part which they take in fertility—are some of the more important topics considered. The influence which various methods of farming have upon fertility of the soil and the best methods for conserving fertility are studied. The subject of judging, rating and scaling soils forms a part of the work. (Given only in alternate years. Given in 1904-05).

Course VI. Laboratory practice (a) The analysis of dairy products. I.

This course including the proximate analysis of milk, butter and cheese, the determination of volatile fatty acids, iodine absorption number, the chemical and physical properties of fatty bodies and the determination of adulterated dairy products. This work is planned to meet the wants of those who wish to become familiar with the methods employed in investigations in dairy-chemistry.

(b) The analysis of foods. II.

This work includes the determination of starch, sugar, cellulose, and the more common and important compounds found in food materials.

Particular attention is given to the analysis of wheat and flour for commercial and technical purposes. Ample facilities are offered in the laboratory for this work. The object of this course is to familiarize the student with the methods which are employed in investigations relating to the chemistry and economy of human and animal foods.

Special attention is given to the study of methods of analysis and to the determination of compounds as pentosans, and the more important proteids in cereal products.

Course VII. The analysis of soils and fertilizers. (a) The chemical analysis of soils. I.

Laboratory practice. This course includes practice in the chemical analysis of soils and the study of the chemical methods employed in soil investigations. The course includes the analysis of soils by the use of strong and weak acid solvents. Particular attention is given to

the study of the organic compounds, and experimental work is applied to field investigations.

(b) The physical analysis of soils. II.

Laboratory practice in the physical analysis of soils by means of Hilgard's eleutrator, and the sedimentation methods as modified by the use of centrifugal apparatus.

Courses VII (a) and VII (b) are intended for students who desire to make a specialty of the subject of soils.

ANIMAL HUSBANDRY.

Equipment. Representatives of some of the leading breeds of cattle, sheep and swine are kept at University farm. Each year a number of experiments are under way in the feeding of these classes of animals, and breeding experiments are also undertaken with sheep and swine, and theoretical experiments with the smaller animals. Experiments in summer feeding cattle, sheep and swine wholly or in part on pasture are carried on each year. The new veterinary building provides a temporary live stock judging room. Herds of blooded stock near the institution, and the annual show of live stock at the state fair serve for extended observation of breeds and methods of management.

Course I. Stock breeding. [One-half semester.]

Discussion of the principles of stock breeding as affecting breed maintenance and breed formation; standards of excellence and comparison of standards of breeds; heredity and the influences affecting it; prepotency, fecundity and their relation to successful breeding; the influence of nutrition on animal growth and form and the effect of artificial conditions, early maturity, selection and pedigree.

Course II. Feeding animals. [One-half semester.]

The principles of nutrition and digestion as applied to economical production; feeding rations and nutritive ratios, feed stuffs and methods of feeding, feeding of breeding stock and show stock, management of animals during pasture, yard and stall feeding for the block, feeding for specific production of wool or flesh, selection of animals for the feed lot, stabling suitable for the various classes of live stock.

Course III. Stock judging. [One-half semester.]

This course is calculated to meet the needs of students desiring to become expert stock judges and of those who wish to study animal form with a view to becoming breeders of superior animals. Score card work in combination with the presence of living specimens is a feature of this course. Students are drilled in judging from the standpoints of breed, type, form, stamina, quality, breeding capacity, suitability for feeding and for general and specific production. Special opportunities are given for judging live animals fitted for the block and in judging the dressed carcasses after slaughter, thus determining by observation the quality of animals judged.

Live stock practicums: Feeding and stable management of cattle, horses, sheep and swine, recording and calculating amounts of pasturage obtained from different forage crops, keeping herd records, writing pedigrees and recording animals, calculating feeding records and cost of production, mechanical analysis of carcasses of animals to determine total amount of meat, and proportionate amounts of fat and lean, determinations of fat and lean meat with especially designed apparatus; calculating percentages of different parts of the carcasses.

DAIRY HUSBANDRY.

Equipment. Students in the college course have the advantages of the equipment of the dairy school. The feeding and breeding experiments in the dairy division of the experiment station serve a most useful purpose in the collegiate instruction. The cordial relations existing between the department of agriculture and the other state institutions are often advantageous to college students well advanced in dairy work.

Representatives of several breeds of cattle are kept for class use. Herds in the vicinity and those shown at the state fair are useful to students in this course.

Course I. Dairy stock and dairy farm management. [One semester '02-'03.]

Lectures, first semester, three hours per week. Practice work one hour per week. This course is given during the first semester of the junior year. The lectures cover the breeding, rearing and management of dairy stock, the points and characteristics essential in animals intended for the dairy, practice work in judging dairy stock, and the management of the dairy herd.

Course II. Feeds and feeding. [One semester.]

This course consists of lectures covering scientific and practical questions underlying the principles of feeding. Practice work is given in formulating rations, in estimating the comparative value of food stuffs and in other problems connected with the subject. (Given in years beginning with even numbers.)

Course III. Course in factory dairying. [One-half semester.]

This is offered during the session of the dairy school, beginning November 21. Lectures in the forenoon on dairy bacteriology, dairy chemistry, the care of milk and cream, lactic cultures, flavors, creamery milk, cream ripening and churning, working and packing butter. In the afternoon students are given two and a half periods' practice in the factory training rooms and in the dairy laboratory.

Dairy practicums: Students are offered training two semesters in compounding rations, feeding cows, rearing calves, milking and many other details in the management of the dairy herd; operating hand separators, and other modern farm dairy appliances, the manufacture of butter and cheese and work in the dairy laboratories.

ENTOMOLOGY.

Students who have completed the entomology offered in the school of agriculture, or its equivalent, may elect course I or course II.

Course I. General entomology. [One semester.]

Structure and classification of insects. The dissection of type, life history and habits of leading forms. Each student is required to make a collection of at least fifty insects.

Not given in 1903-04.

Course II. Economic entomology. [One semester.]

Lecture upon injurious insects of Minnesota and best methods of combating same. The use of insecticides and spraying machinery. Beneficial insects.

Not given in 1904-05.

Course III. Forest entomology. [One semester.]

The students in this course must have a thorough, practical training in elementary entomology and economic entomology in order to put into

practical use in field work the principles to be learned in both of these courses. He must take course I at some time during his course in forestry, which is to be followed by course II; the two, however, can be taken together if the student's time permits. The student will be directed in the special study of insects affecting the forest and will be encouraged in doing field work, in collecting, identifying, and in the life history of forest insects.

Open only to students in the forestry course.

Not given in 1904-05.

Course IV. Comparative anatomy and histology of insects. [One semester.]

A detailed study of structure of representatives of different orders of insects. Not given in 1904-05.

Six periods of laboratory work and one lecture. Must be preceded by course I or its equivalent.

HORTICULTURE.

Equipment. In the college course in horticulture students are expected to avail themselves of the excellent facilities afforded by the nurseries, orchards, gardens and forest garden of University farm and the collections in the museums of the University. They will also find that the vicinity offers many especially good lessons in nursery work, landscape gardening, fruit growing, vegetable gardening and greenhouse management.

Course I. Fruit growing. [One-half Semester.] '04-'05.

Lectures. The study of the geography of fruit growing; outlook for fruit growing, planting, tilling and fertilizing of fruit lands; diseases and insects injurious to fruits, spraying, harvesting, and marketing varieties of vegetables.

Course II. Vegetable growing. [One-fourth semester.] '04-'05.

Lectures. Geography of vegetable growing, tilling and fertilizing vegetable lands, irrigation and rotation of crops, seed growing and seed testing, vegetables under glass, pollination, diseases and insects injurious to vegetables and their prevention, harvesting and marketing varieties of vegetables.

Course III. Green houses and their management. [One-fourth semester.] '04-'05.

Lectures and laboratory work. Green house construction and management, temperature, soil, watering, benches, propagation by seeds, cuttings, layers and graftage, prevention of diseases and extermination of insects injurious to vegetables, rest and growth periods of plants, plants for greenhouse cultivation.

Course IV. Nursery work. [One-fourth semester.] '05-'06.

Lectures and laboratory work. Seedage, layerage, cuttage, graftage, planting, pruning, thinning, storage of nursery stock, tillage of nursery lands, insects, diseases injurious to the nurseries and their prevention.

Course V. Plant breeding. [One-fourth semester.] '05-'06.

Lectures and laboratory work. The fact and philosophy of variation; crossing of plants, origination of domestic varieties.

Course VI. Floriculture. [One-half semester.] '04-'05.

This course will include the work outlined in course III, but in addition instruction will be given in the growing of flowers in the open borders in summer, and practical work in this line will be required.

Course VII. Pomology. [One semester.] '04-'05.

Courses I, II and III together and courses IV, V and VI together each make one full semester.

VETERINARY MEDICINE AND SURGERY.

The new veterinary building gives ample facilities for laboratory and clinical work. The hospital furnishes a variety of cases for study and demonstration. The dissecting room affords material and opportunity for studying the digestive organs and locomotor apparatus, and museum materials are being collected.

Instruction is given by text-book, lectures, collateral reading and by practice work in the hospital. The lectures are illustrated by means of skeletons, manikins, charts and by the living animal. Anatomy of the digestive organs and the higher physiology of digestion are given prominence in this work. Theory and practice of medicine are carried further than in the school of agriculture course. Infectious diseases of domestic animals are studied with references to causes, recognition, prevention and methods of control. Certain medicines which the intelligent stockman should understand are studied with reference to uses, doses and methods of administration. The work in this department continues through two semesters.

Course I. Anatomy. [One-half semester.] '04-'05.

Comparative anatomy of the digestive organs, dissection, collateral reading and recitation.

Course II. Body nutrition. [One-half semester.] '04-'05.

This is an advanced study of the veterinary physiology of digestion, taking up the digestive fluids, nervous mechanism of digestion, absorption and digestion of grains and fodders. It also includes a study of body nutrition, body income and expenditures, sources of heat supply and heat loss, and metabolism. Veterinary physiology, by F. Smith, is used as a text and guide for this work in course II, but students are required to do collateral reading.

Course III. Anatomy. [One-half semester.] '05-'06.

Bones, articulation and muscles of the limbs by dissection, reading and recitation.

This course includes shoeing, diagnosis and treatment of common forms of lameness.

Course IV. Diseases of domestic animals. [One-half semester.] '05-'06.

Lecture and text book work on the diagnosis and treatment of common diseases; common medicines in their doses, uses, dangers and methods of administration.

THE COURSE IN FORESTRY.

The course in forestry in the college of agriculture has been established in response to urgent calls for instruction in this subject. Forestry is really a branch of general agriculture and means the cultivation of forest crops, the same as agriculture means the cultivation of food and other crops. Its

object is to produce the greatest amount of serviceable material on the soil in the shortest time. It is also a business and contemplates business methods.

EDUCATIONAL OPPORTUNITIES.

There are many and obvious reasons why instruction of this kind is especially adapted to fit in with the courses offered in a large University. It will be noted that this course offers to students not only studies which will fit them especially for forestry, but will fit them for general service. At present there is little forestry work undertaken by the state of Minnesota except that of fire protection, but the outlook seems to warrant the statement that the next few years will see much undertaken that will need the assistance and direction of properly trained foresters. Perhaps there is no situation where a forestry school has more natural advantages than here, as this state is still one of the largest lumber producing states, and the opportunities of seeing lumbering carried on in the best manner are most excellent. The establishment of the Chippewa Forest Reserve and its management by the Bureau of Forestry give opportunities which few other sections possess to study the best methods of forest management. The Minnesota Forest Reserve Board contemplates the acquistion of considerable land for forestry purposes, and its management for the production of timber crops. Opportunities are here offered to see, and in many cases to take part in the scaling and estimating of timber, and to work in lumber camps for good pay at practical lumbering operations.

In addition to these general facilities and all of the opportunities offered by the University, students in the forestry course have all the privileges of the collections in the arboretum and forest garden of University farm. The state fish hatchery is nearby and furnishes students excellent opportunities to become acquainted with this important subject, on which a short course of lectures will be given

General C. C. Andrews, the Chief Fire Warden of Minnesota, will give a course of lectures on the prevention and suppression of forest fires—in which work he has been eminently successful.

PLAN OF INSTRUCTION.

The regular course in forestry is a four years' course intended to prepare men to take charge of independent forest

properties, or for the government forestry service, or for positions of teachers.

The first year in this course, for those who enter other than from the Minnesota School of Agriculture, deals with the elementary agricultural subjects that it is important for every manager of rural properties to be familiar with. The forester from the very nature of his surroundings will be largely thrown on his own resources and should be capable of advising as to the best way of managing the farms or grazing lands that are almost always included in large forest properties. The sophomore year and one-half of each of the junior and senior years are devoted to the study of the basal natural sciences underlying the practice of forestry, and to such academic and engineering studies as seem especially desirable here. While French is made optional with German, it is expected that German will be taken in most cases, as it is the most helpful language for those who are to study forestry literature. An opportunity will be afforded to take Spanish, as it may be especially desirable to those who contemplate entering the Philippine forestry service. One-half of each of the senior and junior years are devoted to the study of technical forestry, an important part of which consists of field work and excursions. Every student is required before graduation to take four weeks work in some approved lumber camp, so as to become familiar with common lumbering operations.

Especial emphasis is laid on the value of field work and excursions. This consists in excursions to nearby forests; to lumber camps, saw mills, wood manufacturing and paper mills; to the Boom Company's works on the Mississippi river; to nearby nurseries, and it is expected that arrangements will be made which will afford an opportunity for students to visit some of the forests of Montana, Idaho and Washington at a very low rate. Excursions are also frequently made in connection with the study of botany, geology, zoology (and nursery practice).

OUTLINE OF COURSE IN FORESTRY.

FRESHMAN YEAR.

Students entering the forestry course will be required to take the freshman year the same as other students of the college of agriculture.

SOPHOMORE YEAR.

FIRST SEMESTER.	SECOND SEMESTER.
Botany, short [4]	Botany, short [4]
Chemistry [4]	Surveying [4]
German or French [4]	German or French [4]
Agricultural physics [2]	Trigonometry [4]
Rhetoric [1]	Agricultural physics [2]
Military drill [2]	Rhetoric [1]
	Military drill [2]

JUNIOR YEAR.

FIRST SEMESTER.	SECOND SEMESTER.
Botany, taxonomy [4]	Plant ecology [4]
Forest entomology [4]	Law, elements of contracts [1]
Forest influence and utility [2]	Zoology [4]
Forest by-products [2]	Wood technology and diseases of wood [4]
Forest mensuration [2]	Forest valuation [2]
Lumbering [2]	Sylviculture [2]

SENIOR YEAR.

FIRST SEMESTER.	SECOND SEMESTER.
Geology, I, [4]	Geology, III and IV, [4]
Sylviculture [4]	Forest economics [4]
Elements of economics [4]	European forestry [1]
Vegetable Pathology [4]	Forest administration [2]
	Forest protection [2]
	Fish culture, game protection (Lecture) [1]
	Thesis, seminary in reading forestry literature [2]

Practicums in forestry: Four practicums are required in the course in forestry, viz.: In forest exploitation, forest working plans, forest mensuration, nursery practice. A thesis must be presented in each of the four subjects, giving the results of personal observation.

Forest influence and utility: Influence of forests on precipitation, surface and sub-surface run-off and on springs, on frost, on winds and wind storms.

Forest mensuration and valuation: Methods of determining the volume of felled and standing trees, of whole forest growths; timber estimating. Determining the rate of increase in single trees and forest areas, determining present and future money value of forests.

Lumbering: The harvesting of forest products, logging—including transportation, milling and preparation of the wood for market.

Sylviculture: (a) Sylviculture characteristics of trees, methods of regeneration, improvement cuttings, nursery practice. (b) Characteristics of the great typical forest areas of the world.

Forest economics. History of development of modern forestry, forest conditions here and abroad, relation of the state to forests, forest policies of foreign nations.

Forest administration. A working plan and rules of management for a specified forest area; state and national forest policy.

Wood technology and diseases of wood. Study of the characteristics of commercial woods and their uses. Impregnation of woods, fuel value of woods.

Forest by-products. Study of the products of the forests other than for timber and fuel, including such products as tan-bark, resin, charcoal, medicinal products.

Forest entomology. (This course will be found outlined on page 23.)

European forests. Lectures on the condition in European forests.

Forest protection. Protection of the forest against trespass, fire, insects and diseases; method of preventing washing of soils.

COURSE IN HOME ECONOMICS.

Purpose and scope. The course in home economics offered in the college of agriculture is open to graduates from the school of agriculture, and to graduates of approved high and normal schools. The elementary technical work in household science, household arts and home administration is taken in the school of agriculture, while advanced work in special subjects closely related to the home, as well as the usual culture studies, is given in the college course.

The course in home economics is intended to bring to the vocation of home making the same kind of help which the course in agriculture brings to the business of farming. Aside from the universal need of education of this character there is a marked and increasing demand for trained women to fill institutional positions, not only as special teachers in the several divisions of home economics, but also in administrative positions as competent supervisors of supplies and of hygiene where large numbers are cared for under the management of boards and trustees.

COURSE OF STUDY IN HOME ECONOMICS.

FRESHMAN YEAR.

Division "A" required for those who are graduates of the school of agriculture only.

FIRST SEMESTER.

Mathematics [4]
German or French [4]
Drawing [4]
Geology, historical [4]
Rhetorical work [1]
Physical training [2]

SECOND SEMESTER.

Mathematics [4]
German or French [4]
Drawing [4]
Chemistry [2]
Rhetoric [4]
Physical training [2]

FRESHMAN YEAR.

Division "B."

For graduates of approved high schools or others of equal standing. Students in this division take part of their work in classes of the school of agriculture. For descriptions of these courses, see statement under School of Agriculture.

SEPTEMBER.

Agriculture [4]
Dairy chemistry [4]
Fruit growing [4]
Home management [2]
Cooking [4]
Laundry work [2]
Sewing [4]

FIRST TERM.

Dairying [2½]
Agricultural chemistry [5]
Fruit growing [2]
Entomology [5]
Physics [2]
Forestry [2]
Physical culture [2]
Cooking [2]
Social culture [1]
Sewing [2]
Household art [1]

SECOND TERM.

Vegetable gardening [2]
Plant propagation [3]
Domestic chemistry [5]
Drawing [2]
Dairy husbandry [2]
Economics [3]
Cooking [2]
Home economy [1]
Sewing [2]
Meats [1]
Domestic hygiene [1]

LAST HALF OF SECOND SEMESTER.

Bookeeping [4]
Poultry [3]
Chemistry [4]
Cooking [4]
Sewing [4]
Live stock [2]

SOPHOMORE YEAR.

FIRST SEMESTER.

Chemistry [4]
German or French [3]
English literature [3]
Botany or zoology, short, [3]

SECOND SEMESTER.

Chemistry [3]
German or French [3]
English literature [3]
Botany or zoology, short, [3]

JUNIOR YEAR.

FIRST SEMESTER.

Home economics (course I) [2]
Household science (course III) [4]
Household art (course I) [4]
Psychology [4]
Elective [4]

SECOND SEMESTER.

Home economics [2]
Household science (course I) [4]
Logic [4]
English literature, modern English prose [3]
Elective [3]

SENIOR YEAR.

FIRST SEMESTER.	SECOND SEMESTER.
Home economics (course II) [2]	Home economics [2]
Household science [course II) [4]	Household art [4]
Philosophy—principles of ethics [2]	Pedagogy, philosophy of education [3]
Elective [4]	Floriculture or other horticulture [2]
History—American biography [3] or English literature [3]	Elective [3]

(1) In household science and household art only courses in cooking, sewing and laundering are offered at present.

When approved by the dean and college committee, other subjects given in the college of science, literature and the arts, or in the college of agriculture, may be substituted for the prescribed subjects in the course in home economics.

Women who are sufficiently advanced may study music or art during the junior or senior years, provided that no student may receive more than two semesters' credits in music and art together.

EQUIPMENT.

The Woman's Building contains convenient rooms for the students, with heat, light and water supplied under the best hygienic conditions, while attractive reception rooms give opportunity for a refined social life. The dining room is in a separate building and under competent supervision.

The class rooms and laboratories of the school of agriculture, also the equipment of the state experiment station, are available for purposes of instruction and research.

The courses in physical and biological sciences, in English language and literature and in philosophy and history, which are given in the college of literature, science and the arts, are open to students taking this course, as are also the college laboratories and the courses given in agriculture.

The class room devoted to instruction in sewing, garment drafting and the judging of textile fabrics is commodious, well lighted and furnished with the usual accessories, including collection of vegetable and animal fibres showing the successive stages in manufacture from the raw material to the finished fabric. The school museum of birds of Minnesota is utilized in the study of color and its combinations.

The rooms for instruction in cooking, dining room service and laundering, contain the necessary appliances for manual practice and for demonstration lectures. Specimens of manu-

factured foods, samples of cooking, and laundering utensils and materials and of dining-room and kitchen furniture, are provided. The facilities of the city markets give practice in marketing. The proximity of Minneapolis and St. Paul, in which are found large flour mills, manufactories of cereal foods, canning and pickling factories, and other establishments which prepare food stuffs, make it possible for the classes to visit many places where facts of value are learned. The large public dining-rooms with their kitchens, and the commercial laundries also offer opportunities for gaining valuable practical knowledge in these branches of household science.

The library of the college of agriculture contains a carefully selected collection of books relating to the subject of home economics.

COURSES OF INSTRUCTION.

CHEMISTRY.

Two and one-half semesters of chemistry are required in the freshman and sophomore years. This work is taken along with the classes in the course in agriculture, and includes courses I and II, outlined on page 19. Should the student desire, special facilities are offered for advanced elective work in the Chemistry of Foods, course IV, and the analysis of foods, course VI. Nutrition investigations, including the digestibility of foods, the chemical changes which take place in cooking, and the losses in the preparation of foods form a part of the Experiment Station work; this offers an opportunity for students to study methods of investigation relating to human food problems. Laboratory practice is also offered to advanced students in the study of household problems in which chemistry is involved. Special classes are also formed for the study of dietary problems.

ENGLISH LANGUAGE AND LITERATURE.

The courses in English language and literature are taken in the college of science, literature and the arts.

The scientific movement. (a) This course will take up the study of Darwin, Tyndall, Huxley, Spencer and other well known scientists, from a literary point of view. (b). Influence in the English literature of the nineteenth century.

Literary criticism. A study of development of method and view in the critical appreciation of literature.

Modern English prose. A study of the present literary vernacular in its best examples.

HOME ECONOMICS.

The lectures are intended to give breadth, strength and thoroughness to the concept of home.

Course I. The evolution of the family. Lectures twice a week during the first semester of the junior year. The evolution of the family from primitive conditions, the family as a social and economic institution, the relation of the home to civic life.

Course II. Home administration. Lectures twice a week during the first semester of the senior year. The organization of a home, generic lines of expenditure; domestic service, disposal of waste, the home as a place and an opportunity for the right development of the physical and spiritual natures.

Theses. The theses required in the junior and senior years are upon some one special branch of home economics—distribution of income, home sanitation, hygienic furnishing, household fabrics, food, et cetera, and are intended to familiarize the student with the best sources of information upon the subject; a bibliography of the subject treated is required.

HOUSEHOLD ARTS.

The instruction offered embraces courses in sewing, judging of textiles and harmony of color as related to dress, and is a continuation of the work given in the school of agriculture.

Course I. A study of textiles, animal and vegetable fibres, weaves and dyes, testing fabrics for household use and personal wear, the hygienic values of various fabrics, harmony of color, and the drafting of garments.

Course II. Designed especially to assist the teaching of sewing in graded schools. The preparation, explanation and making of models suited to grade work in the public schools.

HOUSEHOLD SCIENCE.

The work for collegiate classes is a continuation of the instruction given in the school of agriculture, but goes more into detail than in the agricultural high school course. While the home needs are first considered, attention is given to the supply and preparation of food in public institutions, boarding houses, restaurants and hotels; and to the laundry .

Course I. Food economics. [One semester.]

Selection of food materials: (1) Marketing; buying by sample; cost and value; quality as to freshness, flavor, etc. (2) Storage and care of foods, care of cupboards, cellars, refrigerators. (3) Selection, preparation and serving of foods for large numbers; equipment of large kitchen, serving rooms and dining rooms. (4) Kitchen practicums, arrangements, equipment and methods of directing practice work in cooking.

Preparation of foods: (1) Meat products, as beef tea, beef powder and beef extracts: (2) Cereal products and materials made from flours and meals, methods of aerating dough, leavening agents, etc. (3) Manufactured beverages, as cocoa and koumiss, matyoon, etc. (4) Condiments and spices; (5) Confections, as candies and sweetmeats; (6) Sweets, as sugars and syrups; (7) Commercial bakery products, as breads, biscuits, crackers, wafers, etc. (8) Preserving by drying, canning, refrigerating; and with preservatives, salts, sugars, spirits, fats and acids.

A thesis with bibliography on some special topic of household science is required.

Course II. Management of kitchen and dining room. [One semester.]

1. The kitchen:
   a. Kitchen equipment.
   b. Kitchen sanitation.
   c. Labor saving devices.
   d. Disposition and utilization of kitchen wastes.
2. The dining room.
   a. Equipment, furniture, decorations, china, silver, glassware and linens.
   b. Management; setting the table; garnishing and table decorations.
   c. Table service; reception refreshments; formal dinners, etc.
3. Household Inventories.
4. Bills of Fare and selection of food for the dietary, in rural homes, in urban homes, in public institutions, in boarding houses, in restaurants and hotels.
5. Fancy Cookery; meat dishes, vegetable dishes, fruit dishes, pastries, ices, candies, sweetmeats, chafing dish cookery.

Course III. Laundering. [One-half semester.]

Removing stains; dyeing; setting colors; cleaning delicate fabrics, as silks, laces and fine wools; the use of cleaning agents; as soaps, volatile oils, and other chemicals; starches and bluing.

Commercial laundering and cleaning; power washing and ironing machinery; drying apparatus, gathering, distributing, accounts, etc.

HISTORY.

The courses in history are taken at the University in the college of science, literature and the arts.

English constitutional history. The course begins with about six weeks of introductory work on the history of western Europe from the barbarian invasions to the treaty of Verdun. The remainder of the year is devoted to a study of English constitutional history from the Anglo-Saxon conquest to the accession of the House of Hanover. Continental history will be touched upon at various points where its connection with English history makes it necessary.

Studies in American biography. In this course the work will each year center about the political activity of a single

important character. In the choice of a subject two points will be especially borne in mind.

1. To select a character not only important per se but representative of some great historical movement or idea.

2. To select one who has left an abundance of material, valuable not only for his own part but throwing light upon the action of others.

PHILOSOPHY.

The courses in Philosophy are taken in the college of science, literature and the arts.

Descriptive psychology. This course is intended to serve as a general course in psychology, the work consists of the study of a text supplemented by lectures and demonstrations and by the preparation of papers on some psychological topic.

Logic. A study of the nature of knowledge and the principles of formal logic. Jevons' lessons in Logic will be used supplemented by lectures and exercises.

Principles of ethics. An introductory course, comprising a study of the distinction between moral and non-moral phenomena, an analysis of voluntary conduct, and a discussion of the nature of conscience, the meaning of right and wrong, the purpose of life, human responsibility, and the authority of moral law.

Aesthetics. A study of the nature and principles of beauty, and a discussion of the place and function of art in life.

The philosophy of education. The purpose of this course will be to define the purpose of education and the principles which govern in preparing the mind and character of youth for the duties of life. It will include topics, as the following: The influence of physical development upon the mental and the recognition of these facts in education. The order of mind development, and the bearing this has upon matter and method in teaching. The recitation, its purpose and the principles that govern in conducting it.

The School of Agriculture

FACULTY

CYRUS NORTHROP, LL. D., *President.*
WILLIAM M. LIGGETT, *Dean.*
DEXTER D. MAYNE, *Principal, Mathematics, General History, Economics.*
SAMUEL B. GREEN, B. S., *Horticulture, Forestry.*
WILLIAM ROBERTSON, B. S., *Agricultural Physics.*
J. A. VYE, *Penmanship, Accounts.*
HARRY SNYDER, B. S., *Agricultural Chemistry.*
T. L. HAECKER, *Dairy Husbandry.*
M. H. REYNOLDS, M. D., V. M., *Comparative Physiology, Veterinary Science.*
WILLET M. HAYS, M. Agr., *Agriculture.*
THOMAS SHAW, *Lecturer, Live Stock.*
J. M. DREW, *Registrar, Blacksmithing, Poultry.*
ANDREW BOSS, *Animal Husbandry.*
WILLIAM BOSS, *Carpentry, Power Machinery.*
JUNIATA L. SHEPPERD, M. A., *Cooking, Laundering, Home Economics.*
MARGARET BLAIR, *Sewing, Household Art.*
GEORGE H. MORGAN, Major 9th Cavalry, U. S. Army, *Military Science.*
FREDERICK L. WASHBURN, M. A., *Zoology, Entomology.*
CATHERINE COMFORT, *Preceptress, English.*
CLARENCE B. RANDALL, *Drawing, Farm Buildings.*
MARY S. MCINTYRE, B. S., *Librarian, English Composition.*
JOHN W. DYE, *Director of the Gymnasium.*
EDITH SNELL, B. L., *Mathematics, Geography, History.*
L. S. CHENEY, M. S., *Agricultural Botany.*

ASSISTANT INSTRUCTORS

JOHN A. HUMMEL, B. Agr., *Agricultural Chemistry.*
MARY L. BULL, *Cooking, Laundering.*
ARTHUR C. KOERNER, *Music.*
GRACE L. WHITRIDGE, *Physical Training.*
COATES P. BULL, B. Agr., *Agriculture, Rural Engineering.*
LEROY R. CADY, *Horticulture.*

Committees, School of Agriculture

Library: Mayne, Reynolds, Snyder, Hays, Comfort, McIntyre.
School of Agriculture:
Examinations and Registrations: Robertson, Drew, Snell, Bull, Hummel.
Catalogue: Vye, Robertson, Snyder.
Military Drill: Morgan, Green, Haecker.
Entertainment: Mayne, Comfort.
Program: Andrew Boss, Drew.
Health: Reynolds, Mayne, Comfort, Washburn.
Dairy School: Haecker, Wm. Boss, Hays.
Short Course for Farmers: Drew, Shaw, Green.
Outside Dormitories: Mayne, Robertson, Snyder.
Co-operative Societies: Vye, A. Boss, Hays.

CLASSIFICATION OF STUDENTS.

No student with incomplete C or preparatory work will be classified as an A.

No student with incomplete preparatory work will be classified as a B.

No student with incomplete C or preparatory work will be made a commissioned military officer.

STUDENTS IN DORMITORIES.

The Principal of the School of Agriculture has charge of the boys in their dormitory and social life, and the Preceptress has charge of the girls in their dormitory and social life.

From 8:15 a. m. to 4:30 p. m. students not at recitations or chapel are expected to be in their rooms or the library studying or reading.

The rooms shall at all times be quiet, especially in the evening, so that no student may be disturbed.

The Cadet officers shall make daily inspection of the boys' dormitories, under proper supervision of the instructors.

Opening

The school year opens October 3, 1904, and closes March 22, 1905. The fall term closes Friday, December 23rd, and the winter term begins Tuesday, January 3rd. Owing to the shortness of the school year students are expected to be on hand the first day of the term, that registration may be completed and work begun promptly. Students registered in the fall term will not be received after the first two days of the winter term, unless they present a reasonable excuse for such delay.

THE SCHOOL OF AGRICULTURE—ITS PURPOSE.

It is the aim of the school of agriculture to train its students to become useful citizens as well as good farmers and housewives.

The home life of the students at University farm is supervised by members of the faculty, and it is the aim to provide such interests outside the regular school work, as will assist in rounding out the characters of the young men and women. Literary societies afford opportunities for experience in writing, public speaking and debate. The faculty assist at the receptions and social gatherings which provide social pleasures and experience. In the work of the Young Men's Christian Association and the Young Women's Christian Association there are opportunities for training in co-operative religious activity. Student and alumni clubs and organizations, and a progressive periodical, "The Farm Students' Review," published by the alumni, aid in teaching the students how to work for the betterment of agricultural conditions.

The school of agriculture offers a practical course of study designed to fit young men and young women for successful farm life, and it serves as a preparatory school for the college of agriculture.

For the young people who cannot pursue the full college course the school supplies a training in the general branches, supplementary to the grammar school work, and a thorough

course in the leading branches of agricultural knowledge, put in practical form, by means of the constant application of lessons in the field, laboratory, or workshop. The methods employed are always practical. The teaching is so conducted as to educate the students toward the farm, and to develop in them a love for farm life, by showing them the possibilities of such a life. The school has been successful in this respect, and over eighty per cent of its graduates take up agricultural occupations upon leaving the school.

The details of this work, the division of the time for the various subjects, and the range of work required of the students, will be found outlined in the following pages.

Through the endownments and appropriations, of state and national government, the school is maintained without tuition charge, except an entrance fee of $5 to residents and $10 to non-residents, and the co-operative arrangements are so conducted that the students are able to secure excellent board at low rates.

The young men and women of the state, who desire to become farm home makers, are cordially invited to enter the course at the school of agriculture. They are urged to come with suitable preparation—that is, the complete mastery of the common school branches; previous farm experience; and to come with the intention to do earnest and conscientious work.

HOW TO GET TO THE SCHOOL.

Check all baggage to Minneapolis.

Monday and Tuesday, October 3d and 4th, members of the Y. M. C. A., wearing lettered badges, will be at the Union Station in St. Paul, and at the Union, Milwaukee, Great Western, Soo and St. Louis Stations in Minneapolis, to meet and direct new students. Take the Como-Harriet car from either St. Paul or Minneapolis and get off at Commonwealth avenue. A charge of 25 cents is made for transporting trunks at the opening of the school. No charge is made for the return of the baggage, at the close of school, provided it is ready to go on the days assigned.

ADMISSION.

All male students are required to have had six months farm practice before entrance.

Applicants for admission will be examined in English grammar, arithmetic, history of the United States, and geography, unless they present state certificates, or approved county diplomas, showing that they have completed the eighth grade work in these subjects. Students from city or village schools will not be admitted unless, in addition to the above requirements, they present certificates from the pricipals of such schools showing completion of eighth-grade work and honorable standing in deportment. Applicants, whose home schools do not afford complete instruction in these common branches, may be admitted with not more than two conditions, which must be removed, according to instructions given the student upon admission. State High School Board certificates are accepted for work in English, physiology, algebra, geometry and civics.

Students applying for admission, after the opening of the term, will, in addition to the regular entrance examinations, be required to show proficiency in the work done by the class up to the time of their application. Those who cannot enter by the first of November should wait until the beginning of the winter term.

FEES.

With the exception of an entrance fee of $5 to residents, or $10 to non-residents, the school makes no charge. All other expenses are arranged by co-operation of the students.

EXPENSES.

The school expense for the year does not exceed $85. This amount does not include the cost of the required military suit for boys, traveling or personal expense.

The cost to the student for board, heat, light and laundry is the actual cost of maintaining the table and caring for the house. This does not exceed $3 per week. Each month's board is paid in advance. The culinary department is managed by an experienced person and all the buildings are under the supervision of the dean. The buildings are all lighted with electric lights and warmed by steam. The sleeping rooms are each furnished with a bedstead, mattress, dressing bureau, chair and table.

No deductions in charges are made for absence of less than four days. If students are compelled to be absent for that length of time they will be allowed half rates if they make arrangements before leaving.

Text books are furnished at a rental of $1 to students who do not desire to purchase.

Each student is required to pay for breakage of apparatus used in practical work.

A competent nurse is kept on the ground to care for the sick. To meet this expense each student pays 75 cents per term.

A deposit of $5 is required of each student, as a guaranty for the return of all books and other articles borrowed.

On entering school the student makes a payment of $24: $12 board; $5 deposit, $1.25 book rent, reading room and gymnasium; 75 cents maintaining nurse; $5 entrance fee.

All male students are required to provide themselves with the prescribed uniform, which consists of navy blue blouse, trousers and cap, and is as neat and economical a dress as the student can obtain. The suit complete, to measure, is furnished under special contract for $11.65.

Each student provides four sheets, one pair of blankets, one quilt, one bed spread, one pillow, three pillow cases, towels, napkins, comb and brushes.

An assignment of rooms will be made at 9 a. m., March 21, which will hold good until 8 p. m. the first day of the following year. Students wishing to retain their rooms, after vacation, must be on hand when the second term opens, or pay one-half the price of board and room for the time they are late. Students arriving after the dormitories are filled are compelled to find rooms elsewhere, but are allowed a rebate of $3 per month.

REQUIREMENTS FOR GRADUATION.

First—The completion of the prescribed course of study with an honorable standing in deportment.

Second—An essay of not less than one thousand words upon a topic connected with agriculture or home economics.

Third—For young men, a practical experience in field work at the University farm or elsewhere, as shall appear in reports received from responsible sources.

STUDENTS' DEBATING SOCIETIES.

Societies for the purpose of improvement in elocution and debate, and for obtaining instruction in the form of lectures, give excellent opportunities for entertainment and culture.

LECTURE COURSE.

During the school year, a lecture and entertainment course, consisting of six lectures and concerts, is given in the chapel at a cost of seventy-five cents for the series. These entertainments are strictly high grade, and furnish a pleasant relaxation from school work, as well as mental stimulus.

The following program, which was provided during the past year, shows the general character of the entertainments:

Our Folk and Others—October 22, W. I. Nolan; Concert—November 23, The Royal Hungarian Court Orchestra; An Optimist's Message—December 16, Charles B. Landis; Reading—January 23, P. M. Pearson; Jean Valjean—February 17, Harvey Smith McCowan; Concert and Reading—March 10, Masonic Quartette, assisted by Mrs. Josephine Bonaparte Rice.

STUDENTS' CHRISTIAN ASSOCIATIONS.

The Young Men's and Young Women's Christian Associations have for their objects, social fellowship and moral and spiritual development. To this end two receptions are held each year, and Bible classes are held Sunday mornings at 8:30; a general religious service and mid-week prayer meetings are carried on. The associations are non-sectarian, so that all students may find in them an opportunity for Christian activity and mutual helpfulness.

ATHLETIC ASSOCIATION.

The students have a well-organized athletic association and a well-equipped gymnasium. A competent instructor is in charge. An opportunity is thus given for healthful amusement and for needed physical exercise.

COURSE OF STUDY.

FIRST (C) YEAR.

FIRST TERM.

Agricultural botany [5]
*Drawing [2]
Music
English [5]

*Blacksmithing [2½]
*Carpentry [2½]
Military drill [2]
Agriculture [3]
Gymnasium [1]

or

*Laundering [2]
Physical culture [2]
*Sewing [3]
Social culture [1]
Field agriculture [3]

SECOND TERM.

Agricultural botany [5]
*Farm accounts [2½]
Music or literary society work
Comparative physiology [5]
**Study of breeds [4]

*Carpentry [2½]
*Drawing (farm buildings) [2]
*Blacksmithing [2½]
Military drill [2]
Breeds of horses [1]
Gymnasium [1]

or

†Cooking [2]
*Drawing (farm houses) [2]
Physical culture [2]

SECOND (B) YEAR

FIRST TERM.

English [1]
Agricultural physics [5]
Dairy chemistry [2]

*Dairy husbandry [2½] { Dairy lectures; Dairy practice; Dairy breeds }

Fruit growing [3]
Music
Farm mathematics [5]

*Stock judging [1]
Breeding [2]
Military drill [2]
Gymnasim [1]

or

*Cooking [2]
Household art [1]
Physical culture [2]
*Sewing [2]

SECOND TERM.

English [1]
Agricultural chemistry [5]

Dairy husbandry [2½] { Dairy stock lectures; Dairy practice; Dairy feeding }

Music
Agricultural physics [5]
Vegetable gardening [3]

Field crops [5]
Military drill [2]
Gymnasium [1]

or

*Cooking [2]
Home management [1]
Physical culture [2]
*Sewing [2]

COURSE OF STUDY—*Continued.*

THIRD (A) YEAR

FIRST TERM.

Agricultural chemistry [7]
Forestry [3]
Music, Chorus and Quartettes
Entomology and zoology [5]
Poultry [3]
Algebra (5) Optional

Handling grain and machinery [1] *Veterinary science [2½] Gymnasium [1]	or	*Cooking [2] *Sewing [2]

SECOND TERM.

Civics or geometry [4]
Plant propagation [3]
Algebra [5] Optional

Dressing and curing meats [1] *Stock judging [1] Feeding [3] Soils and fertilizers [5] *Veterinary science [2½]	or	Meats [1] Home economy [1] *Cooking [3] Domestic chemistry [3] Domestic hygiene [1] *Sewing [3]

Figures in brackets indicate the number of hours per week in which the subject is pursued. All work in subjects marked thus extend through double time in the daily program.

†Three periods.

**Work outside of class not required.

ASSEMBLY.

On each school day at 11:40 a. m. the students assemble in the chapel. After the opening exercises brief talks are given by the principal, members of the faculty, or invited guests.

Members of the graduating class will, at this period, discuss the best books in literature, and articles on public questions, which appear in the leading magazines.

This plan gives to the students, in the course of the year, many things which will fit them to meet the demands of citizenship in the rural communities.

SCHOOL OF AGRICULTURE—PROGRAM, FALL TERM, 1904.

INSTRUCTOR.	8:15–9:00	9:05–9:50	9:55–10:40	10:45–11:30	11:40	1:15–2:00	2:05–2:50	2:55–3:40	3:45–4:30	4:35–5:20
Blair		B Household Art 5			ASSEMBLY.	C Sewing 1, 3, 5 B Sewing 2, 4		C Sewing 1, 3, 5 A Sewing 2, 4		
Boss, A	C II & IV Horses 3 or 4					B Br'd'g 2, 3				
Boss, W.		A Power Machinery o Carpentry, C 4				B Stock Judging 4	C Carpentry 1 or 2 or 4 or 5			
Bull	C II and IV Agricul. 1, 2, 3			C III Agriculture 1, 2, 3			X Lecture 3		Y Lecture 3	
Cheney	C I Agr. Botany	C II Agr. Botany	C III Agr. Botany	C IV Agr. Botany		A H'dling Gr'n & Mach. 5 CV Agriculture 1, 2, 3				
Comfort		G English		C II English C Soc. Cult. 5			CV Agr. Botany B English 1 or 3			
Drew		C Bl'ks'th'g 5					C Blacksmithing 1 or 2 or 4 or 5			
Dye	A Poul'y 1, 2, 3 A Gym. Work 4 or 5	C Gym. Work 3	C Gym. Work 3	C Gym. Work 3			B Gym. Work 1 or 5	X Lecture 3 B Gym. Work 1 or 5	X Lecture 3 B Gym. Work 1 or 5	
Green	B III Fruit Gr'w 1, 2, 3	B IV Fruit Gr'w 1, 2, 3	B I Fruit Gr'w 1, 2, 3	B II Fruit Gr'w 1, 2, 3		A Forestry 1. 2, 3			A Forestry 1, 2, 3	
Haecker						B D'ry L. 1, 5	Dairy Practice 1, 3 or 5			
Hays				C I Field Agr. 1, 3, 5						
Koerner										A Music 5 B Music 3 C Music 2
McIntyre		C III English								
Mayne	B III Farm Mathematics	B IV Farm Mathematics	B I Farm Mathematics							
Morgan										B Mil. Drill 2, 4 C Mil. Drill 1, 3
Randall			C Drawing 1, 2			C Drawing 1, 4 or 2, 5		C Drawing 1, 4 or 2, 5		
Reynolds		C III Comp. Physiology	C I and IV Comparative Physiology						C II Com. Physiology	
Robertson	B I Agr. Physics	B III Agr. Physics	B II Agr. Physics	B IV Agr. Physics			A Vet Science 2, 4			
Shaw	Study of Breeds 1, 2, 4, 5					Study of Breeds 1, 2, 4, 5				
Shepperd						B Cooking 3 A Cooking 4, 5		C Cooking 1, 4 or 2, 5 B Cooking 5		
Snell	G. Geom.		A Algebra	G Algebra						
Snyder		A Agricultural Chemistry	B II and IV Dairy Chemistry 4, 5	B I III D'ry Chem'try 4. 5 A Lab. Agr. Chem. 1, 2, 3, 4			A Lab. Agr. Chem. 1, 3			
Vye	C Farm Accounts 1 and 2					C Farm Accounts 2, 5 or 1, 4 Lecture 3		C Farm Accounts 1, 4 or 2, 5		
Washburn			A Ento. and Zoology	A Ento. and Zoology						
Whitridge		B Physical Training 2-4	C Physical Training 2, 4	C Physical Training 2, 4						

INSTRUCTOR.	8:15–9:00	9:05–9:50	9:55–10:40	10:45–11:30	11:40	1:15–2:00	2:05–2:50	2:55–3:40	3:45–4:30	4:35–5:20
Blair					ASSEMBLY.	B Sewing 2, 4		A Sewing 1, 3, 4		
Boss, A.	C II, III Horses 4	C I, IV Horses 4				A Feeding 2, 3, 5	A, D and C Meats 1	A Stock Judging 1	Meats 2	
Boss, W.			C Carpentry 4				C Carpentry 1 or 2 or 4 or 5			
Bull	C II, III, IV Agr. 1, 2, 3						X Lecture 3	Y Lecture 3	Y Lecture 3	
Cheney	C I Agr. Botany	C II Agr. Botany	C III Agr. Botany	C I V Agr. Botany			C Agriculture 1, 2, 3			
Comfort	G English		C I IV Eng.	C II English			C Botany			
Drew			C Blacksmithing 5				C Blacksmithing 1 or 2 or 4 or 5			
Dye			C Gym. Work 3				Y Lecture 3	X Lecture 3	Y Lecture 3	
Green	B IV Vegetable Garden 2, 3, 4	B III Vegetable Garden 2, 3, 4	A I Plant Prop. 5 B II Veg. Gard. 2, 3, 4	A II Plant Prop. 5 B I Veg. Gard. 2, 3, 4		C Gym Work 3	B Gym. Work 1 or 5	C Gym, Work 3		
Haecker								A Plant Prop. Lab. 5		
Hays	B II and III Field Crops	B I V Field Crops				B Dairy Stk. Feeding 1, 5	Dairy Practice 1, 3 or 5			
Koerner										B Music 1, 3 C Music 2, 4
McIntyre								B English 4		
Mayne			A Civics 1, 2, 3, 4			Economics				
Morgan										C Mil. Drill 1, 3 B Mil. Drill 2, 4
Randall			C Drawing 1 and 2			C Drawing 2, 5 or 1, 4		C Drawing 2, 5 or 1, 4		
Reynolds			C III Comp. Physics	C I, IV Comp. Phys.				A Vet. Science 2, 4		
Robertson	B I Agr. Physics	B II Agr. Physics	B III Agr. Physics	B IV Agr. Physics				C III Comp. Phys.		
Shaw	C II and III Study of B'ds 1, 2, 3, 5	C I and IV Study of B'ds 1, 2, 3, 5				Study of B. 1, 2, 3, 5				
Shepperd	A Domestic Hygiene 2		B I Home Managem't 5	A Home Economy 5		A Cooking 2, 3, 5		C Lauudering 1 or 4 B Cooking 2, 3, 5		
Snell	A Algebra	G Algebra	G Geometry	A Geomet. 1, 2, 3, 4						
Snyder	A Domestic Chem. 3, 4, 5	A Soils and Fertilizers	B I and IV Agr. Chem.	B II and III Agr. Chem.						
Vye	C Farm Accounts 1 and 2					C IV Farm Accounts 2, 5 C III Farm Accounts 1, 4 Lecture 3		C I Farm Accounts 1, 4 C II Farm Accounts 2, 5		
Whitridge		B Physical Culture 2, 4	C Physical Culture 2, 4	C Physical Culture 2, 4						

Courses of Instruction

AGRICULTURAL BOTANY.

This subject is taught with special reference to its bearing upon the every day problems that present themselves to the farmer and gardener. It is profusely illustrated with flowers and plants from the greenhouses and nursery. Some instruction is given in the use of the compound microscope. Students are thus enabled to study intelligently, in an elementary way, the tissues of plants. By this means they get a clear idea of the general principles of plant structure and vegetable physiology.

AGRICULTURAL CHEMISTRY.

In agricultural chemistry one term is given to the study of the elements and compounds which are of most importance in agriculture. This work is planned to prepare the student for intelligent study of the subject of the chemistry of foods, soils and fertilizers, and at the same time to familiarize him with the more important chemical changes which take place in every day life. Laboratory practice forms a prominent feature of the work in agricultural chemistry. In the chemistry of foods, the composition of plant and animal bodies, the chemistry of the plant and of its food and growth, the chemistry of animal nutrition, digestibility and value of foods, and the laws governing the economic uses of foods, are some of the subjects considered. The composition and the utilization of farm crops for food purposes, and the application of the principles of chemistry to plant and animal life form the basis of this work.

AGRICULTURAL PHYSICS.

The general principles of the science are taught, special stress being laid upon those which to the greatest extent enter into the business of the farmer. About half the time is devoted to experimenal work, which includes capillarity of soil; diffusion and osmosis of gases and liquids; heating, lighting, and ventilation; farm machinery in particular, pumps, eveners—especially three and four horse, pulleys, milk-testers, centrifugals, incubators, wind-mills, steam and gasoline engines; friction and lubricants; tensile strength of wire and binding twine of different grades; lightning and lightning protection. The foregoing indicates the character of the work, the attempt being to give the student an acquaintance with the laws of nature that he may act with reason and work to advantage.

AGRICULTURE.

Soils; selecting and planning farms; subduing the fields; drainage; irrigation; fences; roads; buildings; water supply; groves; farm life and the relations of general science in agriculture.

Farm management: Remodeling farm plans; rotation of crops; manuring; production and management of farm manures, green manure crops, and the place of commercial fertilizers in field management in various parts of the state; farm administration, management of fields in relation to fertility, to weeds, to yields, to live stock and to profits. Keeping weeds down by helpful crop rotations, careful field work, and good methods of farming generally; study of botany and habits of the various species of harmful weeds; methods of destroying each class of weeds.

ALGEBRA.

Algebra is optional during the third year. This work covers Wells' New Higher Algebra through simple equations. Special attention is given to literal notation, negative numbers, the equation and factoring.

BLACKSMITHING.

The students are instructed in the management of the forge and fire, and in bending, shaping and welding iron and steel. They are required to make links, rings, hooks, bolts, clevises, whiffletree-irons, tongs, cold-chisels, punches; in short, to become familiar with all the operations necessary to enable them to do their own repair work when they return to the farm. Particular attention is given to rapid and accurate welding and to the shaping and tempering of steel tools. The forges used are such as any farmer can make for himself, and each student is taught to make his own tools, so that he will be able to furnish his shop with very little outlay.

BREEDS OF HORSES.

The aim in teaching this subject is to familiarize the students with the types of horses best representing the breeds adapted to the conditions that obtain in the state. Score cards are used, and standards of excellence made for comparative work.

BREEDING.

Students receive instruction in the principles that govern breeding; on the influences that affect heredity and in the care and management of breeding stock. Pedigree receives careful consideration, and each student is required to make out pedigrees of two or more pure bred animals. They are also required to become familiar with methods of keeping live stock records of all kinds.

CARPENTRY.

Instruction is given by means of lectures on the care and use of the common carpenter tools, such as should be found on every farm; also on methods of farm building construction, framing, laying out rafters, stairways, estimating building material, painting, etc. In the carpenter shop students are required to make such exercises as will give them some practice in using carpenter tools. They are required to make mortise joints, splices, drawing boards, hammer handles, eveners, cupboards, etc.

Each student is required to file his own saws, sharpen his planes, chisels, etc., and to lay out rafters for buildings.

CIVICS.

During the last term of the course students receive instruction in this science, and graduate with a good understanding of the origin, necessity, nature and various forms of government, and the machinery employed to carry on public works, establish justice and provide for the common defense; of the organization and management of local institutions, the town, the village, the city, and the county; the manner in which states are created and the affairs administered; the three departments—legislative, judicial and executive—and the functions of each; the interdependence of the state and its citizens, as well as the powers and obligations of each, by due attention to which the state may be strengthened and the condition of its citizens ameliorated.

The relation of the state to the general government; the constitution, and the powers it confers; and the provisions for amendments, are taught. The more important principles of commercial law, including contracts, agency, partnership, corporations, and commercial paper, receive attention. Instruction is also given in the United States method of surveying public lands.

COMPARATIVE PHYSIOLOGY.

During the first year students take one term of applied physiology. This is an effort to connect technical physiology with the necessities of every day life. The work includes a study of the general plan and structure of the body and the various individual tissues of which it is composed; also sources of heat and energy, digestion, and the relation of food materials to the various tissues of the body. Considerable attention is given to diseased and innutritious foods, food adulterations and narcotics. The circulation is studied with especial reference to the relation of the blood and lymph to tissue nutrition and tissue waste.

Accidents, including poisoning, are studied for the purpose of giving a practical knowledge of what to do in emergencies. Considerable attention is given to the subject of clothing, the various materials in use being considered with reference to fitness for special purposes. Some time is also given to the study of

common physiology, of the organs of circulation, digestion, respiration, nervous system, and the relations of bacteria to the common diseases, especially such diseases as consumption, typhoid fever, etc. A brief study is also given to the subject of digestion in the lower animals.

The class work is illustrated by means of large charts, skeletons, manikins, and dissections. Important points of difference between human and animal physiology are pointed out in preparation for the third year's work in the veterinary class. Matters of home and personal hygiene are interwoven with the physiology work.

COOKING.

The course in cooking extends through five terms of the curriculum as given below, with the subjects covered in each term:

(C) Second term—Kitchen management; care of cooking utensils and silverware; measuring and invoicing; cooking vegetables, cereals and breads.

(B) First term—Cooking meats, preserving fruits and vegetables.

(B) Second term—Eggs, beverages, soups, salads and table service.

(A) First term—Marketing and care of foods; dairy dishes, made over dishes, invalid cooking.

(A) Second term—Desserts, food rations, dietaries, confections, bills of fare and dining room.

DAIRY CHEMISTRY.

The chemical and allied changes which take place in the handling of milk and its manufacture into butter and cheese, and the application of these principles to the production of milk and its products form the basis of this work.

DAIRY HUSBANDRY.

Farm dairy lectures.—A course of lectures is given in farm dairying, giving instruction in the care of milk and utensils, explaining the principles involved in creaming milk by the gravity and centrifugal processes and giving full instruction in regard to running farm separators and the manufacture of butter and cheese in the farm dairy.

Dairy practice.—Students receive practical training in the most advanced methods of creaming milk, ripening cream, churning, working and packing butter, the manufacture of sweet curd cheese, and measuring the value of milk by the Babcock test and lactometer. This practice work begins the third week of the first term and continues through the school year.

Dairy stock.—During the last half of the first term students receive instruction in regard to characteristics of the various breeds of dairy cattle, their origin and comparative adaptability for the dairy. Lectures are given upon the points desirable in animals intended for the dairy. The students have practice work in judging dairy stock.

Feeding.—During the second term lectures are given covering both the scientific and practical phases underlying the principles of feeding. Practice work is given in compounding rations and estimating the comparative value of food stuffs.

DOMESTIC CHEMISTRY.

The combination of human foods to form balanced rations, dietary studies of families, cost and value of foods, losses in the cooking and preparation of foods, cereal food products, animal food products, adulterations of foods and their detection, fuels, soaps, dye stuffs and colors, composition of common household utensils, the household water supply, preparation of home made baking powders, bakers' chemicals, composition, food value and characteristics of tea, coffee, chocolate, cocoa, molasses, honey, vinegar and spices, the grading and testing of wheat flour and the chemistry of bread making, form the essential parts of this work.

DOMESTIC HYGIENE.

Several lectures by a physician will be given upon maidenhood, maternity and infancy. These special lectures will be supplemented by the regular lectures which consider the health of the family as dependent upon pure food, pure water, personal cleanliness and proper habits as well as upon heredity. The aim is to impress the truth that a knowledge of and obedience to the laws of hygiene are essential to the preservation as well as the restoration of health.

DRAWING.

The student is taught the practical value of drawing for the purpose of designing and arranging buildings, machinery, etc. He makes drawings of the shop exercises, then works from his own drawings, thereby learning the application.

Designs are made for dwellings, barns, outbuildings, and machinery. As practical subjects for their designs students are requested to bring from home data for plans of buildings needed on their farms. Estimates are made of the amount of material required and cost of construction.

DRESSING AND CURING MEATS.

The instruction given the boys consists of demonstration lectures on the preparation of meat for farm use. They are required in addition to take two weeks' practice in dressing, cutting and curing such meat as is likely to be used on the farm. Work is also given them in selecting and judging fat stock, and in judging dressed meats.

ENGLISH.

(C) The first year's work in English consists of almost daily practice in the simpler forms of composition. Applicants for admission to the C class should be familiar with the inflections of nouns, pronouns and verbs, the definitions and classifications of phrases and clauses and the common case constructions.

(B) Once a week throughout the school year the members of the B class will prepare short essays, and submit them for criticism.

(A) At the option of the English Department a series of literary programs will be presented in chapel by the members of the graduating class. The numbers will include abstracts of leading magazine articles, biographical sketches, book reviews and selections from fiction; special prominence will be given to authors depicting American life.

ENTOMOLOGY AND ZOOLOGY.

The class in entomology receives instruction of a practical nature. The course is divided as follows:

Classification of insects; habits and life histories of injurious forms with special attention to insect pests found in Minnesota. The nature of different insecticides and methods of application are discussed. The student spends some time in becoming acquainted with the appearance and habits of beneficial insects. Each student must collect fifty insects representing at least twenty-five different kinds.

FARM ACCOUNTS.

The work in accounts is applied to the transactions which the student meets in the various duties on the farm. He is taught to keep his accounts, that he may know at any time the profit or loss of any department of his business, and is thus enabled to plan intelligently.

FARM ARITHMETIC.

Instruction in this subject consists of the application of its principles to all kinds of farm problems, where measurements of material, extension, capacity, etc., are required. The student is prepared also to handle with ease the mathematics of the technical courses in the school.

FEEDING.

The principles of feeding as applied to the production of horses, beef cattle, sheep and swine are taught. Special attention is given to the choice and preparation of food for animals during different periods of growth and during the time they are used for breeding purposes and to summer feeding and pasturage. Practice is given in compounding rations that will include in the best manner the food stuffs commonly produced on the farm. Practical lessons in feeding are given at the barns under the supervision of an experienced feeder. Each student thus learns the requirements of each class of stock.

FIELD AGRICULTURE.

Selected portions of agriculture and field crops for girls.

FIELD CROPS.

Place in the rotation; preparation of the land; planting; cultivating; harvesting; storing and marketing of grains, field roots, fiber crops, sugar crops, grasses, clovers and other forage crops; planting, care and use of pastures and meadows.

Laws of heredity and variation; possibility of increasing values; improvement and formation of varieties; general facts as to methods of breeding; specific plans of breeding leading field crops.

FORESTRY.

Includes the consideration of the formation and care of wind breaks and shelter belts; the laying out and planting of home grounds; discussion of the hardiness, habits and value of our native and introduced trees; and the methods of propagating them.

FRUIT GROWING.

Fruit growing is taught with reference to raising fruit for market and in the home garden.

GEOMETRY.

Geometry is offered in the second term of the third year, as an elective in place of civics to those who wish to prepare for a college course. This work covers the first two books of Well's Essentials of Plane Geometry.

GYMNASIUM WORK.

The gymnasium is a large, well lighted, two story brick building. It is well supplied with light and heavy apparatus for general gymnastic and atheletic exercises, together with such appliances as are necessary for the development of a symmetrical body. Besides being fitted up with the finest apparatus, it possesses space and equipment for sprinting, pole-vaulting, hurdling, high and broad jumping, shot putting, etc.

Class work in physical training is required of all undergraduate young men not excused on account of physical disability. Courses are offered on the heavy apparatus, in corrective work, class drills, and athletic training. In addition to the regular class drill, a certain part of which consists of training in athletic sports, the school is represented by a strong basket ball team, a track athletic team, hand ball team, and an indoor tennis team.

HANDLING GRAINS AND MACHINERY.

Practical suggestions for the best methods of harvesting, shocking, stacking and storing of cereal grains. Machinery, adaptation of the various kinds, with reference to the soil, weeds, season, etc.; adjustment with especial reference to durability, convenience in manipulation, etc.

HOME ECONOMY.

The lectures are a study not only of the just proportion between expenditure and income, but of definite proportion in the expenditures made for existence, comfort, culture and philanthropy. A study is made of the sources of income, especially of the income from the farm in the form of house, food and luxuries; the purchase of clothing, household stores and furnishings is considered from the standpoint of the suitable. The relation of cash and credit to cost is also considered. Attention is given to savings and form of investment, a bank account and the use of a check book. Students are required to submit an account setting forth in detail the use of a certain named income expended in the support of a family for one year, embracing not only every item of necessary home expense, but also an outlay made for travel, luxuries, accident, sickness, or other emergencies. The habit of keeping a household account is calculated to strengthen the judgment in the wise use of money.

HOME MANAGEMENT.

The subject includes both housekeeping and home-making, and the instruction is based on the belief that housekeeping is a business as important as it is difficult, and that home-making is the noblest form of human endeavor. The care of the house and household belongings, of the food and the clothing, as well as the ordering of family life are considered in their relation to an adequate plan for

home management. To start the student in the right way of becoming mistress of the business of housekeeping and home-making is the end sought. The practical benefit to be derived from the knowledge students gain in the cookery, sewing, dairy, laundry and other classes, is emphasized and shown in its relation to an adequate plan for the daily program for the home.

HOUSEHOLD ART.

Lectures upon house and grounds, noting the distinctive character of the country home; the sanitary conditions involved in the selection of the site of the house; also the influence of the outlook; an elementary study of architecture in connection with planning a house which will provide "a place for everything" required in housekeeping operations and family life; instruction in the fundamental value of color, form and design in embodying beauty; training the taste and emphasizing the laws of hygiene that should influence the selection of materials and styles in the finishings and the furnishings of the house.

MEATS.

The instruction given to the girls in the subject of meats pertains to the selection and value of different classes of meat, and to the best methods of curing and preserving.

LAUNDERING.

In the first term of C year several lectures are given and practice work is provided in washing, ironing, starching, polishing, cleaning and pressing clothing.

LIBRARY.

The agricultural library now contains six thousand books and about six thousand pamphlets, including reports and bulletins. Aside from the large number of pamphlets and other publications of the different agricultural institutions and societies, a large number of the most important technical and agricultural magazines are kept on file, bringing together all the agricultural literature of any importance.

The librarian of the United States Department of Agriculture having inaugurated a system of co-operation with agricultural college and experiment station libraries, sent an assistant librarian who spent two months reorganizing the agricultural library. Students and teachers can now readily find literature desired, in so far as it is collected in the library, and the thanks of the department are due to the Secretary of Agriculture for the valuable aid given. Further co-operation with the Department of Agricultural and the Congressional Library is being arranged.

LITERARY SOCIETY WORK.

Any student belonging to a recognized literary society of the school may receive credit in the course of study for the work done therein by registering at the beginning of the term, and submitting to the teacher in English all essays to be read by such student before the literary society and rehearsing to said instructor all essays, readings, or recitations with a view to correct pronunciation, expression, etc.

MILITARY DRILL.

All male students of B and C classes, not physically unfit, are required to attend military drill. The students form an infantry battalion of four companies. Students are instructed practically in the schools of the soldier and company, extended order and military calisthenics, and theoretically in the schools of the soldier and company. Officers are selected from class A, non-commissioned officers from classes A and B.

The battalion is considered a part of the Corps Cadets of the University.

MUSIC.

Instruction is given in this subject, not with the purpose of making trained musicians, but to introduce the students to the elementary principles of this art, and to develop in them a love for this most valuable factor in home and social life.

Illustrated lectures, in which music by the masters is used, are given at stated intervals.

PENMANSHIP.

In penmanship the student is taught to write a plain hand with rapidity and ease. Daily drills are given using a free forearm movement.

PHYSICAL TRAINING.

The work done in this department aims at symmetry, co-ordination and control rather than mere physical strength. It is planned to improve the functional activity of the body and to counteract and correct tendencies to incorrect development, especially those resulting from the artificial life of civilization. The work of the beginning class is free hand, based upon Swedish principles, and directed especially to deep breathing, correct carriage and posture. The work of the advanced class includes light apparatus and aesthetic movements for suppleness in action and grace. Vigorous games are given to both classes.

PLANT PROPAGATION.

In this subject the principles underlying the development of cultivated varieties of plants and seed testing are taught; also the propagation of plants by seed, cuttings, grafting, and budding. The work of the class room is illustrated by the orchards, nurseries, forest plantations, gardens and greenhouses on the grounds of the experiment station and by visits to commercial nurseries and greenhouses near by.

POULTRY.

The instruction in this subject will include the following topics: History and characteristics of the leading breeds of poultry; breeding, feeding and management of fowls for eggs and for the market; planning, building and arrangement of poultry houses; managing incubators and brooders. A model poultry house, containing pens of the most improved breeds, incubator cellar, workroom, etc., has been provided, where experimental work and practical instruction are carried on.

SEWING.

The course in sewing consists of five terms' work. During the first term the student receives instruction in the elements of sewing, including different stitches, seams, hems, darning, etc., also practical talks on the use and care of all the implements belonging to the sewing basket. The second year's work consists of cutting and making plain garments, drafting of underwear, children's clothing, shirt waists and cotton dresses, taught by a very simple method, using only the tape line and square.

The third year the more difficult work of dressmaking is taken up; drafting patterns, cutting and fitting of dresses. Lectures are given on textiles, wearing and selection of materials. The study of harmony of color is given special attention. The course is designed to make each graduate capable of doing all kinds of sewing required in the home.

SOCIAL CULTURE.

A course of lectures is given on the usages of society, including manners, behavior, the voice, conversation, forms of address, invitations, etc. Suggestions are made in reference to reading, literary taste and the choice of books. Especial stress is given to the thought that the family life ought to be the highest expression of good society, and that next to the power of thinking correctly is the power of approaching others with ease and speaking with tactful directness.

SOILS AND FERTILIZERS.

The composition of soils, and their properties, the sources of plant food, the kinds and amounts of food required by crops and the best ways of supplying these demands, the various forms in which plant food exists in the soil, farm manures, their uses and action upon the soil, the income and outgo of fertility from the farm, soil exhaustion and soil improvement, the rotation of crops, as based upon the chemistry of soils and the principles governing the conservation of the fertility of the soil form the more important features of this subject.

STOCK JUDGING.

Score cards are used to an extent sufficient to familiarize students with that method of judging, and special efforts are made to do systematic and closely

critical work in the selection of animals representative of the breeds and for breeding purposes. Living specimens are used and rings will be made up for the student contests in stock judging. In connection with the work in dressing and curing meats, the judgment passed on live animals for the block is verified by score cards, judgment of the dressed carcasses and by actual block tests. These tests are made by the students and bring out the percentage of meat in each commercial cut of the carcass. The quality of meat is passed upon in this connection by experts, and a careful report made to ascertain the type of animals best calculated for the production of the most meat of the best quality.

STUDY OF BREEDS.

This work covers a discussion of characteristics of the leading pedigreed breeds of beef cattle, sheep and swine adapted to northwestern conditions; the environments to which each breed is especially suited; and practice in the selection of animals that are representative of the various breeds.

VEGETABLE GARDENING.

Vegetable gardening embraces the study of garden tillage, irrigation, and rotation of crops; transplanting; formation and care of hotbeds; study of garden insects; and the growth of various vegetable crops.

VETERINARY SCIENCE.

During the A year the student takes up a course of study in veterinary medicine, the purpose of which is to fit him for intelligent care of his farm stock. In this course the teaching is done by means of lectures, distribution of mimeographed lecture notes after each lecture, reviews and clinical work at the hospital maintained for this purpose. Lectures are illustrated by means of charts, manikin of horse, skeleton of horse, and various other appliances.

The lectures consist of a series on each of the following subjects: Elementary anatomy; elementary pathology; cause and prevention of diseases; diagnosis and treatment of common diseases, examination for soundness; and a final short course on common medicines, studying their effects, uses and doses. At the hospital clinics students are enabled to examine and care for a variety of cases and to learn the elements of diagnosis for the more common diseases and forms of lameness.

STUDENTS' TRUST FUND.

The class of 1902 left with the school a fund of $100 "to assist by temporary loans at a reasonable rate of interest, deserving students needing such help, who are not below the B class in the school of agriculture." This fund is in charge of a committee, consisting of the secretary, the principal, the preceptress of the ladies of the school, and the president of the A class.

THE LUDDEN TRUST.

The Honorable John D. Ludden, of St. Paul, gave the University of Minnesota $5,000 to be held, invested and re-invested by the University, through its Board of Regents, and the income thereof to be collected, received and applied by said Board of Regents to the financial assistance of students of either sex in the school of agriculture. Mr. Ludden delivered into the hands of the regents for the principal sum one Northern Pacific registered prior lien railway land grant gold bond

of the denomination of $5,000, payable to the University of Minnesota and its assigns in gold coin, on the first day of January, 1997, with interest at 4 per cent per annum, payable quarter-yearly in like gold coin, the fund to remain so invested until the bond matures, unless by reason of changed conditions a re-investment shall be sooner deemed judicious by the Board of Regents for the safety, conservation or continued productiveness of the fund. The premium on the purchase of this first grade security was $212.50, and was paid by Mr. Ludden, thus enlarging his donation by that amount.

Mr. Ludden imposes the following conditions: "The beneficiaries must be youths who are residents of the state of Minnesota; they must be and continue of unblemished moral character, and of temperate and industrious habits, and they must be such as by examination and trial shall evince and maintain a taste, habit and aptitude for study and improvement; and any student who shall fail to come, or shall cease to be, within the above conditions shall forfeit all claims to the benefit of such fund. Subject to these conditions the administration of such income is entrusted to the said board of regents, which may make such rules therefor as they may deem judicious."

This fund produces $200 a year. Those wishing to avail themselves of its benefits should apply to the executive committee of the Board of Regents of the University of Minnesota.

Intermediate Year

FOR GRADUATES OF THE SCHOOL OF AGRICULTURE WHO WISH TO ENTER THE COLLEGE COURSE.

The larger part of the studies in the school of agriculture are technical subjects in agriculture and home making, and in related sciences. Graduates of the school who continue with the college course take a part of their work in the college of science, literature and the arts, where they are in classes with students who have graduated in city high schools.

They find it necessary, therefore, to spend a year in the further study of general academic branches, that they may advantageously enter such classes. To meet the needs of those graduates who cannot better secure such instruction, in high schools near their homes, an intermediate year has been provided.

The following prescribed course, or its equivalent, taken in some other school, is required of graduates of the school of agriculture who desire to gain admission to the college of agriculture:

FIRST TERM.	SECOND TERM.
Algebra [5]	Algebra [5]
Geometry [5]	Geometry [5]
English [5]	English [5]
General history [4]	Economics [4]

The courses in mathematics for the intermediate year cover Wells' New Higher Algebra from simultaneous equations to logarithims, Downie's Higher Algebra, Part 1, and Wells' Essentials of Plane and Solid Geometry, beginning with Book III. The work preliminary to these courses is done by the student in the A year in the School of Agriculture.

The course in English extends through both terms. Two periods a week are devoted to composition, with Scott & Denny's Composition-Rhetoric as a text-book, and three to the study of literature, which will also be made the basis of considerable written work. The characteristic works of the following authors will be studied: Shakespeare, Bacon, Milton, Addison, Gray, Goldsmith, Burns, Wordsworth, Lamb, Macaulay, Ruskin, Browning and Tennyson. Individual members will be asigned readings from various other authors.

Short Course for Farmers

FACULTY

WILLIAM M. LIGGETT, *Dean.*
SAMUEL B. GREEN, B. S., *Horticulture, Forestry.*
J. A. VYE, *Business Methods.*
HARRY SNYDER, B. S., *Agricultural Chemistry.*
T. L. HAECKER, *Dairy Husbandry.*
M. H. REYNOLDS, M. D., V. M., *Veterinary Science.*
W. M. HAYS, M. Agr., *Agriculture.*
THOMAS SHAW, *Live Stock.*
J. M. DREW, *Poultry, Workshop Hints.*
A. BOSS, *Dressing and Curing Meats.*
WM. BOSS, *Farm Mechanics.*
F. L. WASHBURN, M. A., *Insect Enemies.*
COATES P. BULL, B. Agr., *Farm Implements.*
L. S. CHENEY, M. S., *Farm Botany.*
D. D. MAYNE, *Parliamentary Practice.*

To meet the needs of men of mature years, who are busy on the farm the greater portion of the year, a special course of lectures has been prepared. Investigations and experiments by scientific men are uniting to produce great changes in the practice of argiculture and the management of live stock. In order to keep up with the times, the farmer must bring himself into close relations with recent investigations, discoveries and methods relating to his business. This course is organized to meet just this need, and to bring within reach of the busy farmer the results of the latest methods and experiments.

This course will open January 10th, 1905, and continue for eight weeks. Work in lecture room, class room and laboratories extends from 9 o'clock a. m. to 2:30 o'clock p. m. A part of the afternoon will be devoted to study and investigation. The University farm, livestock, barns, greenhouses, grounds and laboratories of the college and school of argiculture afford ample opportunity for interesting study.

There will be no lecture course on Monday, but this day will be spent in visiting places of interest, such as the stock yards, flour and flax mills, greenhouses, stock farms, etc.

For this course a fee of $10 will be charged. Board may be secured in either of the Twin Cities at $3.50 to $4.50 per week.

The school is situated at St. Anthony Park, on the Como-Harriet car line, between St. Paul and Minneapolis. Get off at Commonwealth avenue.

Farmers wishing to register for course, or desiring further information, should address Jas. M. Drew, St. Anthony Park, Minn.

The course of lectures and study is outlined as follows:

Agriculture: Judging the qualities of soils, the selection of farms, planning farms; developing the fields, drainage, roads, fences; developing the farmstead and its buildings; managing fields and growing, cultivating, harvesting and preserving forage and grain crops; the rotation of grain cultivated and grass crops, the use of live stock, and general farm management.

Dairy husbandry: In this division there is a course of sixteen lectures giving an outline of the origin and history of the various breeds of dairy cattle, the characteristics of each and conditions to which each breed is especially adapted; the conformation and type of cow specially adapted to economical dairy work; an outline of the fundamental principles of feeding, the composition and character of the various feed stuffs with plain and practical instruction in rearing young stock and feeding dairy cows. Practice work will be given in judging dairy stock.

Animal husbandry: The course will embrace forty-eight lectures to be given in three series. The first will include twenty lectures, the second, eight and the third, twenty.

The first series will treat of such breeds of cattle, sheep and swine as are now popular in the Northwest, or are likely to become more so. They will dwell upon such features as approved form, the uses for which they ought to be kept, the soil and climate best suited to growing them in the best manner, and differences that obtain between them in form, function and adaptation.

The second series will discuss certain of the more practical phases of animal breeding. They will consider the chief laws that govern breeding and how to turn them to practical account on the farm or on the range, and also the selection of prepotent sires and dams. The place for cross breeding and grading up and the best methods of doing the work will be discussed, and also the nature and value of pedigrees. The value of in-an-in breeding will be dwelt upon and also its danger.

The third series will discuss the feeding and management of beef cattle, sheep and swine on the farm. Foods suitable to each of these classes of animals will be discussed, and the methods of preparing and feeding them to the best advantage. Pastures will also be discussed, and outbuildings, and indeed all the more important features of managing animals from birth to maturity.

A portion of the period allotted to each lecture will be spent in judging animals brought into the class room. Hence forty-eight exercises will be given in the work of judging live stock.

Agricultural chemistry: Soils and foods are made prominent features of the work in agricultural chemistry. Four lectures are given on the chemistry of fertilizers, including the conservation of the fertility of the soil, the composition and use of farm manures. the draft of different farm crops upon the soil and the methods of making the fertility of the soil available as food by the rotation of crops and by other means so as to secure the necessary chemical changes in the soil to produce the highest degree of fertility. Four lectures are also given on the chemistry of foods.

Farm mechanics: The instruction given in this subject will consist of lectures on farm mechanics, taking up such subjects as pumps, farm water systems, windmills, the general principles of steam and gasoline engines, placing shafting,

pulleys and belts; pipe fitting, soldering, etc. Some instruction will also be given on sharpening and using hand tools, such as saws, planes, chisels, and other tools necessary in farm practice.

Farm implements: The lectures on farm implements will be illustrated, as far as possible, by samples. Stereopticon views will be made use of in illustrating machines that cannot well be taken to the class room. It is the aim in these lectures to bring out the lines covering the draft of implements and the objects attained by their use. Suggestions will be made on selection of implements adapted to various kinds of work The care of implements when not in use will also be discussed, and an attempt made to give as fully as possible all information that will be beneficial in the care and handling of farm machinery.

Dressing and curing meats: The work in dressing and curing meats will be given in a course of demonstration lectures. In demonstrating these lectures the animals will be dressed before the class and the reason for each operation fully explained. The method of cutting up the dressed carcass for different purposes will also be shown before the class and the use and value of each cut explained. Sausage making, lard rendering, and the "working up" of all parts of the animals will be taught in a simple and direct way.

Farm accounts: A series of lectures will be given on business forms, business arithmetic and the keeping of simple farm accounts and records.

Farm botany: Eight lectures will be given on the phases of botany, of special interest to farmers; for example, the pollination of flowers; weeds and weed seeds; poisonous plants, fungus diseases of plants and how to deal with them.

Farm horticulture: Lectures will be given on the care and management of the apple and plum in this climate, including such subjects as location of the orchard, selection of the trees, planting, cultivation, green manuring; preparation for winter; advantages and disadvantages of root grafting, budding, and top working; insects and diseases injurious to orchards.

Lectures on the care and management of small fruits will consider the subjects of selection of varieties, planting and cultivation, origin of new varieties, propagation, marketing, winter protection, also the insects and diseases injurious to raspberries, blackberries, currants, gooseberries, strawberries and grapes.

Under vegetable gardening will be considered the growing of potatoes, tomatoes, celery, onions, squash and cucumbers.

Veterinary science: This work includes a series of lectures on elementary anatomy, animal foods and digestion; and causes, prevention and treatment of common diseases of farm stock. An especial effort is made to have this work practical and helpful to men who are actually handling farm stock.

Poultry: Twenty lectures will be given on this subject with special reference to the needs of the Minnesota farmer. The following subjects will be considered: Location and construction of poultry buildings and yards; a study of the breeds best adapted to the farmer's use; the hatching, rearing and management of the farmer's flock; feeding for eggs and for fattening; killing and dressing fowls, and packing for market; marketing eggs.

In addition to the above, four lecture periods will be devoted to farm workshop hints, such as splicing rope, making rope halters and rope belting, and tempering simple tools.

Economic entomology: The entomologist will give a course of lectures on injurious and beneficial insects and will discuss the various insecticides and methods of application.

If there be sufficient demand to warrant, and time permits, a few lectures will be given on birds and their relation to agriculture.

Parliamentary practice: A debating club is made up of the members of the short course class and weekly meetings are held which give opportunity for learning how to conduct public meetings and practice in public speaking.

Dairy School

THE FACULTY

CYRUS NORTHROP, LL. D., *President.*
WILLIAM M. LIGGETT, *Dean.*
T. L. HAECKER, *Professor of Dairy Husbandry.*
J. A. VYE, *Creamery Records and Accounts.*
HARRY SNYDER, B. S., *Dairy Chemistry.*
M. H. REYNOLDS, M. D., V. M., *Diseases of the Dairy Cow.*
W. M. HAYS, M. Agr., *Forage and Pastures.*
J. M. DREW, *Buildings and Stable Conveniences.*
WILLIAM BOSS, *Instructor in Practical Engineering.*
B. D. WHITE, *Instructor in Creamery Management.*
M. SONDERGAARD, *Instructor in Cultures and Starters.*
H. L. RUSSELL, Ph. D., *Dairy Bacteriology.*
A. W. PARKIN, *Instructor in Cheese Making.*
ED. K. SLATER, *Assist. Instructor in Creamery Work.*
H. J. CREDICOTT, *Assist. Instructor in Cultures and Starters.*
HENRY SANDHOLT, *Assistant in Creamery Work.*
C. B. MOAK, *Instructor in Dairy Laboratory.*
MISS JULIA BRUDE, *Instructor in Sweet Cured Cheese Work.*

The next session of the Dairy School will open Monday, November 21st, 1904, and continue four weeks.

This course is designed to furnish persons, who are actually engaged in the manufacture of butter and cheese, in creameries and cheese factories, an opportunity to become more skilled in their work, and also to study the many problems which have a direct bearing upon the dairy industry. Recognizing the fact that such persons cannot be away from business for a long period, the term has been so arranged that the time of each student is fully occupied by lectures and actual work in the creamery training room every hour of every working day of the term.

The rapid growth of the dairy industry in the Northwest calls for constant enlargement in equipments for dairy hall. With each succeeding year as dairy products manufactured in our creameries, take higher rank in quality and finish, the character of the instruction given must be of a higher order. To meet these requirements the training rooms are each year equipped with the best apparatus, and the corps of instructors is composed of the most skillful workmen and best instructors.

No pains will be spared to maintain the high standard which the school has attained. Each member of the faculty has special qualifications for the duties to which he has been assigned. The lecture course and practical instruction are arranged with special reference to giving the greatest amount of training and practice possible in a four weeks' session. Large additions have been made to the equipment of the dairy hall in both butter and cheese departments; in fact, it has everything needed for conducting the work by the most approved methods.

Instruction is divided into seven courses:

1st. Lectures covering the entire field of dairy husbandry.
2d. Practical work daily in the butter room.
3d. Practical work daily in the cheese room, where the manufacture of flats, cheddars, Swiss, brick, Edam and Gouda cheese will be carried on.
4th. Practice work in the laboratory, examining milk, making daily composite tests, and the pasteurization of milk and cream.
5th. Practical engineering, steam fitting and plumbing.
6th. Practical work in factory bookkeeping.
7th. Practice work with cultures and starters.

I.—LECTURES.

The course of sixty lectures furnishes in a plain and concise form the most valuable information for those who are interested in any branch of agriculture, covering, as it does, the most important points in the breeding, rearing, feeding and general management of dairy stock, the economical production of milk, growing and preserving of forage and grain crops, the management of meadows and pastures, management of barns, stables and yards, construction of silos, co-operative dairying, creamery and cheese factory management, judging and marketing dairy products, the chemistry of milk, dairy bacteriology, engineering, animal hygiene and treatment of the common diseases of the dairy cow.

II.—BUTTER MAKING.

The running of separators; ripening and churning of cream; the proper acidity of cream to secure best flavor; how to churn, wash and salt butter so as to avoid specks and mottles; to secure good grain and best methods of preparing for market—are some of the points which receive special attention. As all creamery men should be able to judge butter from a commercial standpoint, students are trained daily in the art of scoring butter by the score card.

III.—CHEESE MAKING.

The work in the cheese room is conducted on a large scale, including the manufacture of several brands of fancy cheese. The fact that there is a demand for these at highly remunerative prices has induced the Regents to provide the necessary means for carrying on this work.

A complete record of every step taken is required of each student. Here is a good opportunity for cheese makers to meet, investigate new methods, make experiments on doubtful points, compare notes, and thus gather in a few weeks knowledge that otherwise would take years to acquire.

IV.—MILK TESTING.

It has been found that the value of milk for both butter and cheese is measured by the per cent of fat content, and nearly all our factories and creameries now base the payment for milk on the fat content. It is therefore necessary for every factoryman to familiarize himself with the best methods of milk testing. The chemist gives a general outline of the work, but in order that each student may have thorough training in milk testing daily exercise is given. Steam, turbine and hand power machines and other apparatus are provided and operated in the laboratory.

The pure and wholesome milk and cream supply for our cities is a matter of vital importance, and there is great need for improved methods of handling milk intended for this purpose. To meet this, milk and cream pasteurizing apparatus of the latest and most improved makes has been provided for the dairy school, and a few advanced students will be given instruction in this work.

V.—MOTIVE POWER.

The work in engineering consists of practical talks on the construction, care and management of creamery engines and boilers, pumps, injectors, heaters, etc., and work in the practice room.

In the practice room is provided an eight horse power simple, slide-valve engine, three types of boiler feed pumps, two types of deep well pumps, one injector, two milk pumps and a steam gauge, which the students have the privilege of examining and operating. Instruction is also given in pipe fitting, placing shafting, babbitting bearings, soldering, etc.

It is the aim to make this work as practical as possible. Questions of interest on the subject are freely discussed.

VI.—FACTORY BOOKKEEPING.

All the essential features of factory accounting from the receipt of the milk to the returns in net proceeds are thoroughly considered. Paying for the milk according to the fat content, or otherwise, is fully explained. The students do, in books provided, the actual one month's accounting of a creamery.

VII.—STARTERS AND CULTURES.

Since all students who are admitted to the school have had some experience in the routine work of running separators, and since the most important part in butter making is the art of uniformly making a product having a fine flavor and good keeping qualities special attention is given to cultures, starters and pasteurization. Constant additions will be made to the equipment needed to make this course inviting to those who wish to fit themselves for masters of the art of creamery butter making.

REQUIREMENTS FOR ADMISSION.

Experience has shown that students who have had some practical training in the creamery or cheese factory before coming to the dairy school are, as a rule, the ones who are able to make the most of the course; it is therefore required that persons who intend to take this course shall have had at least one season's experience before coming to the school. No entrance examination is required.

EXPENSE.

A registration fee of $15 is required of each student. Students can board in either city and reach the school by street car, or board can be secured near the school for from $3.50 to $4.00 per week. Each student is required to supply himself with two white suits, including caps, to be worn during working hours in the creamery and cheese rooms. The suits may be procured for about $1 each.

DAIRY CERTIFICATES.

The Regents will grant dairy certificates to students who have taken the course and passed a satisfactory examination and in addition have demonstrated by at least one year's work in a factory that they have acquired special skill in the art of butter and cheese making, and are thoroughly qualified to take charge of a creamery or cheese factory.

To reach the school from either St. Paul or Minneapolis, take the Como-Harriet street car and get off at Commonwealth avenue.

Address applications for admission to T. L. Haecker, St. Anthony Park, Minn.

Rural School Agriculture

Wm. M. Liggett, Dean of Department.
Willet M. Hays, In Charge.

As provided by law, this department is co-operating with the State Department of Education in introducing the study of Agriculture and Home Economics into the rural schools of the state.

The progress already made, is, on the whole, very encouraging. A general national movement in progress to make our system of rural schools efficient in industrial education, and more efficient in general education, is giving impetus to the betterment of education for country people. Each of numerous states is experimenting, and some of the experiments are developing successful lines of instruction in agriculture and home economics in the rural schools. The difficulties are also being analyzed. The great benefits to be secured by instruction relating to the farm and the home, are being emphasized. The body of thought suitable to use in giving this instruction in the rural schools, is being separated and arranged in pedagogical form. Some of this material is found suitable to use in reading lessons; some will serve the teacher to use in talks; and some forms the basis of practical work, using simple laboratory methods.

During the past year, this department published "Rural School Agriculture, Bulletin No. 1," a bound book of two hundred pages, and containing 237 exercises. These exercises were prepared by the instructors in the College of Agriculture in a form for the rural school-teacher to have the pupils carry them out. A sufficiently large edition was published so that each county superintendent was supplied with a sufficient number of copies so that he could place one in each rural school in his county. The State Department of Public Instruction has sent instructors into many of the teacher's state summer schools, during the past two years to prepare the teachers of rural schools to use this book. Reports as to the success met by the teachers in using this book have been re-

ceived from county superintendents and others. The concensus of opinion in the state is that the book is very useful in the hands of the rural teachers. Some county superintendents who are taking an interest, are securing teachers better qualified to give instruction in these industrial matters, and are inducing all of their teachers to do the best they can with this book. On the whole, it has met with as much success as could be well expected. Much rests with the county superintendents and others in authority; but most depends upon the teachers. Those teachers who have successfuly used these exercises, have increased the interest of their patrons as well as the pupils in the school.

Some county superintendents have found in the difficulties in the use of this book, reasons for the consolidation of rural schools. Each consolidated rural school could afford one teacher trained in agriculture, and another trained in home economics. Instead of 7000 small rural schools, requiring 7000 teachers trained in these subjects, 1000 consolidated rural schools with 4000 teachers would require only 1000 teachers in each of the two subjects. The department is interested in rural school consolidation, because better instruction could be given in industrial work, and because the state can more easily provide special training in agriculture and home economics for two thousand teachers than for seven thousand.

Owing to the fact that the last legislature did not make further special provision for this work, no further publications have been prepared for free distribution to the schools.

Many addresses have been made by Professor Robertson and others, and this department is in thorough co-operation with those in the state, and nation, who are promoting the introduction of agriculture into rural schools. The most important lines for advancement seem to be: the preparation of books and other helps to be used by rural school teachers; the training of a large number of teachers in agriculture and home economics, and the consolidation of rural schools with pupils conveyed to schools in districts four to five miles square.

A county option law under which counties may consolidate all their rural schools, has been framed by this department and as it meets with well nigh universal approval, it is hoped that it will be enacted into a law by the next legislature. It passed the house unanimously during the last legislature and failed because it did not reach the senate in time for proper consideration.

The Agricultural Experiment Station

WM. M. LIGGETT, *Director.*
WILLET M. HAYS, M. Agr., *Agriculturist.*
SAMUEL B. GREEN, B. S., *Horticulturist.*
HARRY SNYDER, B. S., *Chemist.*
T. L. HAECKER, *Dairy Husbandry.*
M. H. REYNOLDS, M. D. V. M., *Veterinarian.*
ANDREW BOSS, *Associate in Agriculture, in charge of Live Stock.*
FREDERICK L. WASHBURN, M. A., *Entomologist.*
T. A. HOVERSTAD, B. Agr., *Superintendent Sub-station, Crookston.*
HERMAN H. CHAPMAN, B. S., B. Agr., *Superintendent Sub-station, Grand Rapids.*
J. A. HUMMEL, B. Agr., *Assistant Chemist.*
COATES P. BULL, B. Agr., *Assistant in Agriculture, Rural Engineering.*
J. A. VYE, *Secretary.*

The Agricultural Experiment Station of the University of Minnesota is devoted to the discovery of facts and processes useful to the farmers of the state, and to disseminate knowledge of improvements in agriculture and home making. This station was established in 1887, under laws enacted by the state and national goverments. It is supported in part by funds supplied through the University by the national congress, and in part by funds appropriated by the state legislature. It has also a small income from sales of products. It has published annual reports since 1892, eighty-two general bulletins, sixteen press bulletins; fourteen class bulletins; and twenty-four press bulletins have been published by its sub-station at Grand Rapids.

The work of experiment stations embraces a wide range of agricultural subjects included under the headings of agriculture, horticulture, forestry, animal husbandry, dairying, agricultural chemistry, entomology and veterinary science.

Bulletins giving the results of experiments are published in editions of 15,000 copies. These are sent free to all farmers

in the state who ask to have their names placed on the station mailing list, and the postoffice department carries them free under the director's franking privilege.

The experiment station is located at University farm, St. Anthony Park, where most of its officers also teach in the college and school of agriculture. It uses the larger part of the University farm, containing 250 acres.

The officers of the experiment station are ever ready to advise by letter or by personal interview, and the correspondence of the station increases annually.

The experiment station is in co-operation with the U. S. Department of Agriculture and with several experiment stations in other states. Besides the sub-stations mentioned above it is assisted by nearly a score of trial stations, associated with the State Horticultural Society. It has also enlisted several hundred farmers and seed growers as seed co-operators who are aiding the station in disseminating its newly originated and tested varieties of field seeds. Nearly fifty farmers are serving as statistical co-operators and are assisting joint agents of the station and of the U. S. Department of Agriculture in securing data as to the cost of growing crops, and of producing livestock products.

PUBLICATIONS OF THE DEPARTMENT OF AGRICULTURE.

BULLETINS OF THE EXPERIMENT STATION FOR 1902.

Annual Report for 1902.

General Bulletins:

No. 77. Insects notably injurious in 1902.
No. 78. Experiments in sheep husbandry.
No. 79. Investigations in milk production.
No. 80. Alfalfa.
No. 81. Review of the work of the Northeast Experiment Farm.
No. 82. Haemorrhagic Septicaemia.

Press Bulletin:

No. 16. The Criddle mixture.

THE FARM STUDENTS' REVIEW.

The Alumni Association of the School of Agriculture, with some aid by officers of the department, publishes a monthly agricultural paper. This paper aims to keep the graduates in

touch with each other, and with the department, and provides a medium through which they may relate their experiences in various lines of farming, and home making. It publishes articles by graduates, students, members of the faculty and by others especially qualified to discuss agriculture, live stock, dairying, horticulture, agricultural chemistry, home economics, the rural school and other subjects relating to country life. It serves also as a semi-official organ of the Alumni Association and of the Farmers' Club of Minnesota (an organization made up of students and ex-students of all the courses of the department of agriculture).

Students

COLLEGE OF AGRICULTURE.

SENIORS—4

Gaumnutz, Daniel Asher, St. Cloud.
Hoagland, Ralph, St. Anthony Park.
McGuire, Arthur James, Hegbert.
Matthews, Mary Lockwood, Cambridge City, Ind.

JUNIORS—7.

Boerner, Emil Godlieb, Buffalo.
Cuzner, Harold, Minneapolis
Jehle, Robert Andrew, St. Paul.
Parker, Edward Cary, St. Anthony Park.
Thompson, Anna Adele, Cottage Grove.
Tierney, Charles Nicholas, Farmington.
Widmoyer, Leslie Rudolph, Dresbach.

SOPHOMORES—6.

Carnine, Philip K., Aberdeen, S. D.
Hall, Mary J., Winnebago.
Mowry, Herbert Hager, Minneapolis.
Peck, William Argalus, St. Anthony Park.
Tierney, Dillon Parnell, Farmington.
Wilson, Archie Dell, St. Anthony Park.

FRESHMEN—13.

Allen, Philip Torrey, Marquette, Mich.
Blair, Donald Scripture, St. Paul.
Cox, William Thomas, Lowry.
Gaumnitz, Amos John, St. Cloud.
Leager, Marc Carl, Aberdeen, S. D.
Olson, Oscar Milton, Montevideo.
Peterson, William Arnold, Olivia.
Pfaender, Max, New Ulm.
Rose, John DeCew, Detroit.
Soares, Alberto Gualter, Minneapolis.
Tomhave, William Henry, Fergus Falls.
Torrance, James Benjamin, Minneapolis.
Winther, William Martin, Fergus Falls.

THE SCHOOL OF AGRICULTURE.

INTERMEDIATE YEAR. 10.

Alexander, Fannie P., Brownton.
Boss, John, Zumbro Falls.
Johnston, Christine M., Robbinsdale, R. 2.
Jonson, Axel E., Rockford, Ill.
McLaren, Harley E., Buffalo Lake, R. 1.
Paterson, Thomas G., St. Cloud, R. 2.
Tyson, Robert E., Redwood Falls.
White, Hall B., Winnebago City.
Whitney, June D., Minneapolis.
Wilkins, Annie L., Minneapolis.

"A" CLASS—90.

Amidon, Perry N., Houston.
Anderson, Andrew D., Wadena.
Andrews, John K., Faribault.
Atkins, Frederick W., Columbia, S. D.
Blair, Ruby I., Lewiston, R. I.
Bradford, Albert N., Empire.
Brueck, Charles F., Battle Creek, Iowa.
Bunker, Bessie I., Minneapolis, R. 5.
Burggren, David C., Cannon Falls, R. 5.
Campbell, Helen M., Merriam Park.
Chermak, Emma, Chatfield, R. 4.
Chesley, Fred, Anoka.
Cin, Clara, Donnelly.
Cody, Ella F., Minneapolis.
Cooper, Lee E., Adrian.
Crandall, Chas. N., Rockford.
Dean, Wm. L., St. Anthony Park.
Dick, Ethel M., Afton, R. 20.
Dickinson, Wesley A., Buffalo, R. 4.
Dinsmoor, Charles D., Austin, R. 3.
Emerson, Rudolph, W. Concord, R. 2.
Ericson, Alfred L., Hector, R. 1.
Ferch, Sarah E., Eureka, Cal.
Finseth, Arthur K., Kenyon, R. 2.
Frear, Dana W., Minnetonka.
Gillis, James R., Cedar.
Gleason, Minnie E., Northfield, R. 4.
Goodall, Archie J., Bathgate, N. D.
Graham, Ralph M., Rochester, R. 1.
Grant, Geo. H., Faribault, R. 7.
Gregg, Victor H., Austin, R. 1.
Hacking, Earl L., Forest Lake, R. 28.
Hagerman, Wm. F., Morris.
Hall, Frank W., Fairmont, R. 1.
Henderson, George, Halstad.
Hendrickson, Katherine, Grant.
Hohle, Ola A., Hector, R. 1.
Holland, Rasmus, Hanley Falls.
Holmberg, Ruth H., Renville.
Horton, Thomas J., North Branch, R. 2.
Hovde, Minnie L., Godahl.
Hoverstad, Emeline, Dennison, R. 2.
Howe, Lizzie R., Kellogg, R. 1.
Jensen, Andrew, Kanaranzi.
Johnson, Ida M., Louisberg, R. 1.
King, Curtain A., Spring Valley, R. 4.
Kinyon, Wallace W., Norcoss.
Kjos, Elvin A., Rushford, R. 3.
Knorr, Frederick, St. Anthony Park.
Lampson, Stella M., Lampson, Wis.
Ley, Bertha H., Minnetonka, R. 1.
Ley, Lizzie L, Kellogg, R. 2.
McCabe, Lulu M., Minneapolis, R. 1.
McEwen Wright A., Hutchinson.

Mallett, Angie A., Minneapolis.
Marple, Ernest E., Wendell.
Mather, Sophie M.,
Faribault, R. 3.
Maxcy, Nannie,
Curran, Ill., R. 11.
Mayland, Edwin,
Rushford, R. 3.
Miller, Edwin B.,
Minneapolis, Station F. R. 1.
Moak, Clarence B.,
Minneapolis.
Muir, Harry S.,
Winnebago City.
Nygren, Herman J.,
Lake City, R. 3.
Orton, Geo. E., Marietta.
Ostergren, Reuben G.,
St. Paul, R. 7.
Ouren, Alfred, Hanska.
Parker, Edward C.,
St. Anthony Park.
Pearson, Matilda,
Louisburg, R. 1.
Peterson, Carl H., Lynd, R. 1.
Pond, Harold H.,
Minneapolis, Station F. R. 1.
Roehrs, Wm., Ceylon.
Rollefson, Carl O.,
Clarkfield, R. 1.
Rose, Maud, Detroit, Minn.
Schrepel, Minnie, A.,
Le Sueur, R. 1.
Sheldon, Louis J., Paynesville.
Smith, Elizabeth,
Farmington, R. 2.
Squire, Ernest P.,
Kenmare, N. D.
Stangeland, Arthur W.,
Marathon, Iowa.
Stewart, Charles D., Sherburne.
Stimpson, Herbert E.,
Albert Lea.
Svarstad, Anne, Bath, S. D.
Swenson, Edward,
Willmar, R. 1.
Tanner, Alice V., Brownsdale.
Washburn, Edson D.,
Monticello, R. 2.
Wasson, Harris B., Belview.
Watson, Edwin J., Morris.
Wedge, R. C., Albert Lea.
Wells, Zoe A., Hensler, N. D.
Wilder, Davis E., Austin.
Wood, Augusta A., Waseca.

"B" CLASS—162.

Ainslie, Geo. G., Rochester.
Angell, James B.,
White Bear Lake.
Apitz, Robert H., Amboy.
Atkins, Arthur D.,
Columbia, S. D.
Bailey, Clyde H., Minneapolis.
Barker, Emil V., Atwater.
Beeson, C. M., Breckenridge.
Betts, Alice G., Fairmont.
Bleecker, Mary E.,
Mantorville, R. 2.
Bleecker, Wm. L.,
Mantorville, R. 2.
Bredvold, August J., Belview.
Burkholder, Amy C.,
Winnebago City.
Burtman, Edor, Lester Prairie.
Burtness, Carl, Caledonia, R. 1.
Burton, Hazel, Deep Haven.
Bush, Harvey M., Dover.
Carleton, Lizzie A.,
Plainview, R. 1.
Carlton, Mabel M.,
Medford, R. 1.
Carr, Linnie M.,
Long Lake, R. 1.
Carroll, Harry B., St. Paul.
Carter, Bessie J., St. Peter.
Carver, Archie L.,
Faribault, R. 1.
Chapman, Lula E., Osseo, R. 4.
Chase, Clement G., Farmington.
Cole, Marcus C., Davies.
Cooley, Fanny A.,
Alexandria, R. 2.
Cram, Myrtle I.,
St. Anthony Park.
Crozier, John B., Minneapolis.
Curtis, Jay L.,
Alexandria, R. 3.
Cutlar, Lester B., Sumter.

Dailey, Lawrence E., Pipestone.
Davenport, Emelyn L., Western.
Day, Harry A., Cedar, R. 2.
Detwiler, Samuel B., St. Anthony Park.
Dike, Geo. E., Northfield.
Dixon, Helen C., Mora.
Dodds, Mabel, Wheaton.
Doehne, Lulu E., New Ulm.
Donovan, Raymond L., Dundas.
Downie, Hector, Wawanesa, Man.
Downie, Jennette E., Faribault, R. 1.
Downing, Laura, St. Charles.
Dunn, Catherine A., Lakeville, R. 1.
Edwards, June A., Spring Valley.
Ellsworth, Horace W., Cannon Falls.
Ely, Herbert I., St. Croix Falls, Wis.
Engelbert, Anna R., Kennedy.
Evenson, Nels O., Strout.
Fischer, Joseph, Lynd, R. 1.
Fish, Gertrude B., Utica.
Flom, Joseph O., Dennison, R. 2.
Frenn, Albert E., Red Wing, R. 1.
Gammon, Inez E., Excelsior, R. 3.
Gardner, Harriet R., Bigstone.
Garrett, Harry D., New Brighton, R. 1.
Gaumnitz, Florence, St. Cloud, R. 1.
Gibson, Blossom E., St. Anthony Park.
Gilson, Forrest W., Fort Ripley.
Gove, Albert S., Bingham Lake, R. 1.
Greaves, Harold A., Northfield.
Grey, Arthur B., North Branch, R. 3.
Gudal, Jorgen O., Bricelyn.
Gudal, Nellie B., Bricelyn.
Hall, Avis C., St. Anthony Park.
Hall, Chas. E., Fairmont, R. 1.
Hammer, Ir J., Utica.
Hanson, Almon J., Big Lake.
Hanson, Fred W., Superior, Wis.
Hanson, Henry, Norseland.
Harper, Roy S., St. Paul.
Hathaway, Floyd C., Winnebago City.
Haugen, Olai, Zumbrota, R. 1.
Hilgeson, Halge, Minneapolis.
Hoagland, Jessie M., Minnetonka Mills, R. 2.
Hodgson, Victor A., Luverne.
Holmquist, Alice W., Providence.
Holtmeier, Theodore J., St. Bonifacius, R. 1.
Houser, Clarkson W., Louisville, Ky.
Hulst, Geo. W., Fair Haven.
Hunt, Robert J., River Falls, Wis., R. 1.
Jenkins, Wm. G., Minneapolis.
Jernell, Jennie S., Minneapolis.
Johnson, Charles N., Northfield, R. 4.
Johnson, Clara M., Baldwin, Wis., R. 4.
Johnson, Emil A., Willmar.
Johnson, John S., St. Paul Park.
Johnson, Mary M., Sherburne.
Johnson, Sydney H., Gibbon.
Kanten, Iver C., Milan, R. 1.
Keller, Peter J., Merriam Park, R. 1.
Kern, Harry F., Lake Elmo.
Kingsbury, Victor H., Monticello.
Kloos, John D., Chaska, R. 3.
Langness, Lena, Baltic, S. D.
Langseth, Oscar H., Worthington, R. 2.
Larson, John S., Ulen, R. 1.
Lathrop, Mabel A., Forest Lake.
Lathrop, E. A., Forest Lake.
Leavitt, Geo. D., Red Wing, R. 1.
Le Gro, Emma, Bertha.
Lydon, Edward, Kellogg.
Maass, Wm. H., St. Bonifacius.
McClure, Irvin D., Manhattan, Ill.
McNelly, Chester L., Caledonia, R. 1.

McNelly, Mabelle,
Caledonia, R. 1.
Mallett, Gertrude M.,
Minneapolis.
Martin, Nathaniel, Clear Lake.
Martinson, Henry R.,
Sacred Heart.
Mattice. Norman L.,
Minneapolis, Station D. R. 1.
Merrill, Alfred S., Minneapolis.
Mills, Rodney N., Buffalo, R. 3.
Monson Eva D.,
Elbow Lake, R. 2.
Moore, Harry C., Hutchinson.
Moores, David S., Big Lake.
Murdock, Harry L.,
Worthington.
Murphy, Hazel I., Hamline.
Nelson, Josie E., Minneapolis.
Nodell, Benjamin A.,
Minneapolis, R. 5.
Norskog, Caroline M.,
Eddsville.
Norman, Hilma, Kandiyohi.
Nugent, Marie A., Hegbert.
Ott, Robert L., Albert Lea, R. 4.
Palmer, Ernest G.,
Minneapolis, R. 5.
Palmer, Vincent J.,
Minneapolis, R. 5.
Parten, Lillie T., Minneapolis.
Pedersen, Jens C., Minneapolis.
Pepin, Jos P., Minneapolis, R. 1.
Peterson, Laura C.,
Minneapolis, R. 4.
Perkins, Bert B.,
Monticello, R. 4.
Powell, Leonard H., Marshall.
Putnam, Fayette H., Big Lake.
Quam, Stella, New London.
Ramsland, Rudolph J.,
Sacred Heart.
Ray, Mary L., St. Paul.
Retzlaff, Minnie B., New Ulm.
Rich, Ralph W.,
St. Anthony Park.
Richardson, Horace E.,
Faribault.
Robertson, Lynn S., London.
Rose, Myrtle I.,
New Brighton, R. 9.
Sanborn, Hubert H.,
Minneapolis.
Sargent, Forrest H.,
Red Wing, R. 2.
Sauby, Julia T.,
Elbow Lake, R. 2.
Sherman, Etta L.,
Merriam Park.
Sorenson, Arthur M.,
Albert Lea.
Strand, Lars K., Ada.
Swenson, David, Willmar.
Swenson, Edgar B.,
Louisburg, R. 1.
Talle, Marie B., Kenyon.
Talle, Peder O., Kenyon.
Thayer, Roy C., Manhattan, Ill.
Trondson, Albert O., Lakefield.
Tuttle, Lucius P., St. Charles.
Ville, Henrietta M.,
Echo, R. F. D.
Webster, Alfred A.,
Lafayette, R. 1.
Welch, Horace L., Corvuso.
West, Ralph L., Minneapolis.
Wildner, Clarence L., Superior.
Wilhelmson, Wilhelm,
Spring Grove, R. 2.
Wilkus, August J., St. Paul.
Winslow, Fay B.,
Chatfield, R. 4.
Winther, Wm. M., Fergus Falls.
Wood, Frank G., Waseca.

"C" CLASS—260.

Aanes, Susanna, Clarkfield, R. 1.
Anderson, Albert B.,
White Willow.
Anderson, Henry W., Starbuck.
Anderson, Martha, Mattson.
Anderson, Theodore,
Hazel Run.
Anderson, Wm. A., Highwood.
Austin, Reed S., Minneapolis.
Babcock, Genevieve, St. Paul.
Bailey, Phoebe G.,
West Duluth.
Bartholomew, Ross,
Richfield, R. 3.
Bauch, Ernest E. W.,
Glogan, Germany.

Bauch, Richard M.,
Glogan, Germany.
Beaulieu, Francis D.,
White Earth.
Bellinger, Frederick W.,
Cannon Falls.
Benham, Kenneth R.,
St. Paul.
Bergh, Edmund C., Hendrum.
Berg, Lena M., Tronjem.
Betts, Roy W., Fairmont.
Bingham, James O., St. Paul.
Blase, Arthur.
North St. Paul, R. 3.
Bond, LeRoy M., St. Paul.
Borgendale, Charles,
Lac Qui Parle.
Bork, Albert, New Paynesville.
Borlaug, Helen M., Kenyon.
Bowen, Ray R., Kanaranzi.
Bowman, May V., Minneapolis.
Brekke, Andrea J.,
Kenyon, R. 4.
Briggs, Lyman H., Houston.
Brown, Neil J., Whalan, R. 3.
Brush, Elbert P., Angus.
Burger, Irene E., Staples.
Busse, Walter E.,
Merriam Park, R. 1.
Calderwood, Ralph, Newport.
Carlson, Lillian, Minneapolis.
Charles, Fred M., Minneapolis.
Chermak, Mabel C.,
Chatfield, R. 4.
Churchill, Lucian A.,
Wilmot, S. D.
Cin, Sarah, Donnelly.
Clapp, Harry H., Roberts, Wis.
Clark, Edward K., Minneapolis.
Clay Burton M., Minneapolis.
Cooley, Harvey W.,
St. Anthony Falls Station,
Minneapolis.
Corser, Frederick, Minneapolis.
Cummings, Elmer F.,
Beaver Creek.
Dahlberg, Anna E.,
Fergus Falls.
Dahlquist, Henry D., Warren.
Davenport, Lelia G., Western.
Davis, Mortimer,
Monticello, R. 1.
Dedon, Denton, Taylor s Falls.
DeMars, Stuart, Minneapolis.
Denzer, Frank J.,
West St. Paul, R. 1.
Dickerman, Claude S., Elgin.
Dixon, Samuel C.,
North St. Paul.
Downie, John, Wawanesa, Man.
Doyle, John B., Wayzata.
Dukleth, Oscar, Hendrum.
Dunn, Samuel W., Minneapolis.
Dusschee, James T., Lanesboro.
Dyrdahl, H. K., Hazel Run.
Eckblom, Theodore V.,
St. Paul.
Elwell, Chester, Minneapolis.
Enright, Thomas S.,
Rose Creek, R. 1.
Erickson, Hannah, Nelson.
Eustis, Murray S.,
Forest Lake, R. 26.
Evensen, Edwin N.,
Spring Grove, R. 2.
Evenson, John, Jr., Gibbon.
Evenson, Otto T.,
Sacred Heart, R. 3.
Fawcett, Charles R., Superior.
Feroe, Peter J.,
Granite Falls, R. 1.
Flom, Halvor A., Nansen.
Follingstad, Louis M.,
Zumbrota, R. 6.
Forbes, Lee S., Worthington.
Frear, Aureline J.,
Minnetonka Mills.
Fulford, Willard, Minneapolis.
Gammell, Myrtie A.,
Grand Meadow, R. 1.
Garrett, Walter C.,
New Brighton, R. 1.
Getchell, Leslie G., Morris.
Gilles, DeWitt C., Minneapolis.
Graham, William B., Freeport.
Green, Frank E., Minneapolis.
Greenwalt, Dorothy A.,
Withrow, R. 21.
Greenwalt, Lillian C.,
Withrow, R. 21.
Hall, Jessie M., Minneapolis.
Hall, Ray N., Winnebago City.
Halvorsen, Magnus,
Norway Lake.
Halverson, Oscar,
Spring Grove, R. 2.

Hanson, Minnie, Henning.
Hanson, Victor H., Herman.
Harris, John S., St. Paul.
Hartenstein, Edw. C.,
St. Paul Park.
Hastay, Clifford T.,
Minneapolis.
Haugen, Clara, Clarkfield.
Hefty, Oliver,
Spring Grove, R. 2.
Heimark, Andrew H.,
Granite Falls, R. 1.
Heimark, Carrie J., Clarkfield.
Heimark, Ole J., Clarkfield.
Herreid, Bert A., Hills.
Heywood, Ralph M.,
Minneapolis.
Hilden, Hans A., Watson.
Hille, Hans O., Webster.
Hille, Jens, Webster.
Hjermstad, Morten, Norseland.
Hospes, Marion T., St. Paul.
Howard, Minnie F., St. Paul.
Hunstad, Peter N., Bath, R. 1.
Iverson, Andrew,
Zumbrota, R. 1.
Jacobson, Oscar P., Elmdale.
Jaquith, Roy E.,
Minnetonka, R. 1.
Jenson, Emma F.,
New Ulm, R. 3.
Johnson, Adolph G., Kron.
Johnson, Anna G.,
Casselton, N. D.
Johnson, Ferdinand A.,
Sacred Heart, R. 1.
Johnson, Frank A., Herman.
Johnson, Herbert M.,
Cambridge.
Johnson, Theodore J.,
Northfield, R. 4.
Johnson, Tosten E.,
Spring Grove, R. 2.
Kacerovsky, Josephine,
St. Paul.
Kartrude, Eilert H., Hardwick.
Kaske, Albert, Anoka, R. 3.
King, Mary I.,
Spring Valley, R. 4.
Kelmer, Edgar L., Faribault.
Klinkhammer, Annie,
Heidelburg, R. 2.
Knutsen, Salmer, Lanesboro.
Kordell, Frank H.,
Merriam Park, R. 1.
Kreher, Jennie M., Minneapolis.
Lane, Dwight J.,
Minnetonka, R. 1.
Langer, Jos. F.,
Plainview, R. 3.
Lathrop, Orley K., Forest Lake.
Laugen, John, Houston, R. 1.
Lenhart, Ella M.,
Merriam Park, R. 8.
Linder, Leopold S., Mankato.
Lindgren, Nancy H., Mattson.
Lloyd, Roy, Minneapolis.
Long, Ralph W.,
Luverne, Minn.
Lund, Emil, Vining.
Lunde, Sigrid,
Spring Grove, R. 2.
McArthur, Graham S.,
Hancock.
McLean, Wm.,
St. Anthony Park.
McNallan, Michael J., Kellogg.
Mackin, Levi, Wheaton, R. 1.
Madsen, Nettie C., Hutchinson.
Maring, Gina, Nansen.
Marple, Ruth L., Wendell.
Matz, Louis T., St. Paul.
Mayne, James C.,
St. Anthony Park.
Meisch, Henry A., Rollingstone.
Melsnes, Martin,
Sacred Heart, R. 1.
Monson, Orville J., Elbow Lake.
Murphy, Harley F., Hamline.
Myhre, Carl A., Caledonia, R. 1.
Myhre, Ole A., Caledonia, R. 1.
Myhre, Rena, Audubon.
*Nesbitt, Norman, Minneapolis.
Nielsen, Agnes E., Evansville.
Noltimier, Mark, Hamline.
Nolitmier, Zoa E., St. Paul.
Norskog, Conrad B., Eddsville.
Nussbaumer, Alfred, St. Paul.
O'Connell, Florence E.,
Minneapolis.
O'Connell, Jennie B.,
Minneapolis.

*Deceased.

O'Connell, Patrick,
Goodhue, R. 5.
Oie, Severin, Sacred Heart, R. 4.
Olson, Arthur O., Brandon.
Oppegard, Bertha, Sacred Heart.
Oppegard, Henry A.,
Sacred Heart.
Osmundson, Ole N., Mallory.
Otte, Walter J., Randolph.
Palmer, Roy H.,
Minneapolis, R. 3.
Palmer, Wm. A.,
Bloomington, R. 3.
Pearson, Julick, Gladstone.
Pederson, Emma P.,
Cannon Falls, R. 3.
Peter, Emil, St. Paul, R. 2.
Peterson, John M., Dawson.
Peterson, Peter M., Nelson.
Peterson, Wallace E., Waverly.
Phelan, Robert V.,
Edina Mills.
Philley, John L.,
Louisburg, R. 1.
Pickett, Allan L.,
Superior, Sta. A.
Pierce, Fred C., Lewiston, R. 2.
Plumb, Philip S.,
Mount Vernon, N. Y.
Ramsted, Elvin S., Audubon.
Rask, Oliver H., Hendrum.
Rathjen, William, Kanaranzi.
Raymond, Newton R.,
Minneapolis.
Regan, Katherine M.,
Stillwater, R. 5.
Riechel, Annie M.,
Faribault, R. 4.
Rischatsch, Edward L.,
St. Paul.
Roberts, Arthur H., Roberts.
Roberts, Henry,
Fergus Falls.
Rodin, Emma S., Hubbard, R. 1.
Rosenquist, Albertha M.,
St. Paul.
Roth, Archer W., Danvers.
Rydeen, John A., Olberg.
St. Martin, Victor C.,
Bloomington, R. 1.
Sampson, Walter C. E., Strout.
Sanford, Henry C., Minneapolis.
Sauby, Cora, Elbow Lake, R. 2.
Savage, Edward W., Windom.
Schrepel, Claudina L.,
Le Sueur, R. 1.
Scott, Warner C.,
Minneapolis, R. 3.
Seager, Clarence L.,
Cannon Falls.
Seavey, Clark H., Superior, Wis.
Sederstrom, Alice M.,
Montevideo, R. 4.
Sewall, Thomas R.,
St. Anthony Park.
Simpson, Donald S.,
Minneapolis.
Skalbeck, Oscar,
Sacred Heart, R. 3.
Smith, Percy A., Merriam Park.
Sonstegard, Peter O.,
Georgeville, R. 1.
Speer, Ethel, St. Paul.
Staples, Alice M.,
W. St. Paul, R. 2.
Stearns, Eva M., Ft. Snelling.
Stromberg, Edwin O.,
Buffalo, R. 2.
Sullwold, George J., St. Paul.
Sundblad, Ned J., Osseo, R. 2.
Swanson, Victor J.,
Florine, N. D.
Swenson, Albert E., Watson.
Swezey, Addie A., Clinton.
Swoffer, Walter A.,
Walnut Grove.
Taylor, Edwin W.,
Jefferson, N. Y.
Thayer, Alvin E.,
Manhattan, Ill.
Theilmann, Theodore C.,
Hancock.
Thompson, Alden R.,
Minneapolis, Sta. D.
Thompson, Nettie, Hazel Run.
Thompson, Sophie,
Nansen, R. 2.
Thompson, Thomas, Neilsville.
Thorpe, Florence A.,
Long Lake.
Tomte, Geo. A., Sacred Heart.
Torgerson, Henry C.,
Lanesboro, R. 1.
Tostevin, Guy F., St. Paul.

Tostevin, James F.,
West Superior.
Tostevin, Leslie W.,
West Superior.
Torkelson, Emil H.,
St. James, R. 3.
Townsend, Elmer C.,
Cottonwood.
Trieloff, Erich C., Carver.
Troseth, Pearl M., Nerstrand.
Trovatten, Louis H.,
Hanley Falls, R. 1.
Turner, Elmo, St. Paul.
Tyrrell, Talcott T.,
St. Anthony Park.
Ulrich, Edward, Biscay.
Ulvestad, Peter,
Lanesboro, R. 1.
Urness, Elizabeth M.,
Kenyon, R. 1.
Varley, Aloysius J.,
Clear Lake.
Veeder, Geo. F., Minneapolis.
Veldey, Henry M.,
Hanley Falls.
Vinje, Svein, Dalton.
Volz, Louis W., Claremont.
Von Wald, Herbert C.,
Nerstrand, R. 2.
Voxland, Halvor, Kenyon, R. 4.
White, Frank W., Marshall.
White, Paul R., St. Paul.
Wickstrom, Lizzie B.,
Anoka, No. 1.
Wilkins, Chester A.,
Minneapolis.
Wilkins, Stanley D.,
Minneapolis.
Wille, Fred H., Hancock, R. 2.
Wille, Henry, Morris.
Wilson, Cora,
Granite Falls, No. 1.
Wilson, Clarence O.,
Clarkfield, R. 1.
Wilzbacher, Wm. M.,
Merriam Park, R. 1.
Winters, Chester J.,
Mazeppa, R. 3.
Zimmerman, Bessie J.,
Lampson, Wis.

SHORT COURSE CLASS.—47.

Anderson, Theodore,
Hazel Run.
Atkinson, Jesse J., Minneapolis.
Barsness, Ole N.
Glenwood, R. 2.
Bitzer, Balthas F.,
Cologne, R. 2.
Bond, Le Roy M., St. Paul.
Boyer, Martin L., Jr., Ansel.
Brattland, Albert, Hendrum.
Browver, Bert, Wilkin.
Carlson, Carl O., Erskine.
Connolly, Martin, Clontarf.
Cook, S. Ray, Morrison.
Eddy, Wm. D., Farwell.
Deal, August, Campbell.
Davidson, Adolph F.,
Carver, R. 2.
Edstrom, Arthur,
Goodhue, R. 1.
Fuehrer, H. W., Newell.
Graham, W. B., Freeport.
Greene, Frank E., Minneapolis.
Heifort, Carl L., Stillwater, R.3.
Hjille, Ole, West Valley.
Holmes, Paul L., Chicago, Ill.
Johnson, Oscar E.,
Galuchutt, N. D.
Kern, Albert E., Lake Elmo.
Kern, Oscar J. A.,
Stillwater, R. 6.
Knutson, Carl L., McIntosh.
Knudson, Knud K., Hartland.
Larson, Albert, Goodhue R. 6.
Linner, Ole L., Elizabeth.
McFarlane, Thomas J.,
Alexandria, R. 4.
MacKenzie, Wm., Cedarville.
McMillan, John A., Beltrami.
Mjolsness, Louis, Hendrum.
Munson, Otto T., Cokato, R. 1.
Muedeking, George F., Tracy.
Nelson, Chas. F., Braham.
Newland, John G., Hendrum.
Olson Chester, Adelaide.
Olson, Eric O., Cambridge.
Pederson, P. A., Benson, R. 4.
Reinardy, Nicholas A.,
New Trier.

Siebenaler, Mathias F., New Trier.
Skaug, Gilbert, Albert Lea, R. 2.
Titrud, Emil, Cokato, R. 2.
Westberg, John A., Grandy.
Wilking, Willie F., Nicollet.
Woolery, Roy, Elmore.
Woolsey, Harvey G., St. Paul.

DAIRY SCHOOL—106.

Allison, E., Lone Tree.
Anderson, Wm., Waverly.
Baskin, Clayton, Stoop, Wis.
Bendickson, N. O., Minneapolis.
Berggren, M. O., Forest Lake.
Blume, Clem, Jr., Monticello.
Brado, Martin, Renville.
Bradt, Robb., Lewistown, R. R. 1.
Brown, John, Annandale.
Brown, Nels C., Grove City.
Brunner, F. H., St. George.
Boerner, Geo., Buffalo.
Boulden, R. S., Walnut Grove.
Cashman, J. J., Blooming Prairie.
Christensen, F. C., Florita.
Cockrel, J. H., Hewitt.
Domes, Aaron, Blue Earth.
Drivdahl, Christ, New Sweden.
Ellingwood, M. W., Spencer Brook.
Enderle, Edw. M., Eden Valley.
Esse Clarence, Hayward.
Finch, Bernard A., Montevideo.
Frank, A. T., Buffalo.
Frieler, James, New Munich.
Gardhammer, Harry, Norway Lake.
Gustafson, Ivar, Minneapolis.
Gerland, Harry, Sleepy Eye.
Gillstad, Peter, Deer Park, Wis.
Haberstich, A. C., Ziegler, Wis.
Halls, Albert, Hills.
Hanson, Fred, Alden.
Hartz, Fred, Moscow.
Hawkinson, Arthur, Stark.
Hedtke, Henry F., Bird Island.
Hellevang, Christ A., Webster, S. D.
Hogan, Jno., Mansfield.
John, Frank, Zion.
Killgren, Ed., Carver.
Kielty, Jno. F., Watkins.
Kinney, H. R., Nicollet.
Kral, Robt. H., Leader.
Kvale, Peter, Emmons.
Larson, Harry, Irving.
Lee, Ole O., Gary.
Lundahl, Henry, Alpha.
Lunow, H. H., St. George.
Madson, Andrew, Cosmos.
Marquardt, A. T. Misha Mokwa, Wis.
Marquardt, H. A., Echo.
Melius, Guy, Deer Creek.
Miller, Wallace F., West Concord.
Miller, Fred, West Concord, R. 1.
Mittelstadt, David, Bellingham.
McDougall, P. A., Royalton.
McGuire, A. J., St. Anthony Park.
Moe, Thos., Winthrop.
Moonan, Wm., Waseca.
Morris, H. B., West Concord.
Molkintin, Otto, Carver.
Morrett, C. D., Watkins.
Nelson, Ralph, Baldwin, Wis.
Nelson, Anton H., Stark.
Nelson, Arthue, Dunnfries.
Norskog, Ole J., Eddsville.
Noss, Henry, Rindal.
Olson, Allie, Plato.
Olson, Alvin M., Ashby.
Olson, Peter J., Cokato.
Olson, Siblon, Davies.
O'Mara, Eugene, Duluth.
Ornes, Jens, Bristol, S. D.
Palmer, Jos., Browns, Ill.
Panzer, U. J., Owatonna.
Parkhurst, L. D., Huron, S. D.
Peterson, Erick, Long Prairie.
Pier, Godlieb, West Concord.

Peterson, Arthur, Sleepy Eye.
Plackner, Jno., Carver.
Pond, H. S., Muscoda.
Powell, D. W., Warsaw.
Pundy, Jno. P., Baldwin, Wis.
Rand, Robt. R.,
Winnebago City.
Rishoff, Oliver, Gary.
Rydeen, Jno. A., Olberg.
Sanvik, Ole, Weggeland.
Schulte, H. C., Freeport.
Scripture, B. B., Dodge Center.
Shrewsbury, F., Long Lake.
Shafer, Frank J., Florita.
Smith, Mrs. A. Ripley,
Minneapolis.
Smith, Frank A., Ridgeway.
Sondugaard, M., Ridgeway.
Stalke, Wm., Waconia.
Stensgaard, A. B., Ada.
Strand, Alvin P.,
Chisago City.
Stunteback, John, St. Anthony.
Swenson, C. A., Otisville.
Tommervik, H. O., Gary.
Tuman, G. A., Litchfield.
Ulring, Edw., Webster.
Vanderhyde, C. E.,
West Concord.
Vrooman, H. E., Kasson.
Wallace, W. W., Howard Lake.
Weise, Otto, Lakefield.
Woodworth, Chas. L.,
West Concord.
Young, Geo., Ottawa.

SUMMARY OF STUDENTS.

The college of agriculture	30	30
Intermediate year	10	
A class	90	
B class	162	
C class	260	
Total in regular school course	——	522
Short course for farmers	47	
Dairy school	106	
	——	153
Total		705